Reader, Whoe'er thou art that this doſt buy,
And art reſolv'd *Ingenuous Arts* to try,
Here thou wilt find a Magazine of *Wit*,
The like, (I'm ſure) was never printed yet.

ART's Maſter-Piece:

OR,

A Companion for the INGENIOUS Of either SEX.

In Two PARTS.

I. The Art of Limning and painting in Oil, &c. in all Particulars, viz. Drawing and painting Faces, Bodies, Garments, Landſkips; preparing and laying on Colours; colouring Metzotinto Prints; gilding on Wood, Metals, or Leather. The neweſt Experiments in Japanning, to imitate the Indian way, plain and in ſpeckles, Rock-work, Figures, &c. Receipts for making the ſeveral varniſhes, colours, &c. To make artificial Tortoiſe ſhell. To die or ſtain Ivory, Horn, Bone, Briſtles, Feathers, and ſundry ſorts of Wood for cabinets. The Myſtery of dying Silks, Stuffs, woollen and linen Cloth. To take Spots, Stains, Pitch, Tar, and Iron-moulds out of Silks, Stuffs, Linen or Woollen, and recover faded Silks. The Art of Perfuming and Beautifying. Divers Receipts in Phyſick and Surgery. To make London Powder Ink, other Inks, and the ſhining Japan-Ink: With many other uſeful Things.

II. The Art of making Glaſs of Chryſtal of all Sorts and Colours, and to prepare the Materials. To make Glaſs of Lead of many beautiful Colours. To make Enamel of divers Colours for Gold, Silver, or other Metals. To make Chalcedony like Jaſper or other lucid Stones, and prepare Materials for the Work. To make artificial precious Stones, equal in Beauty to the true; and to colour Globes of Glaſs on the Inſide. The Art of Painting Glaſs in Oil, and annealing and burning on the Colour. Inſtructions to caſt Figures in Wax, Plaiſter, pureſt Metals, &c. Leaves, Flowers, Medals;

And other Matters worthy of Note.

To which are added,

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THE EPISTLE TO THE READER.

KIND READER,

I Think I need make no long apology for this Book, ſince the *Title* is ſufficient to recommend it to the peruſal of the *Ingenious*, tho' it contains but Hints of what in larger Variety of *Curious Things* are more copiouſly inſerted for the accommodation of young Gentlemen, Gentlewomen and others; done with that *Care* and *Exactneſs*, in all the many Particulars, that (without Vain-Glory) I may preſume to ſay, that this or former Ages, have not produced, of theſe kinds, any thing ſo *curious* and *compact*.

It carries with it all along, as link'd in a Chain, *Pleaſure* and *Profit*, and cannot but be grateful to the Fancies, eſpecially of the Younger Sort, who putting in Practice what beſt ſuits their

Minds, may much pleaſe others, and accompliſh themſelves.

As for *Limning* or *Painting*, it has always been in high eſteem with the greateſt and moſt honourable Perſons in the World, and is an innocent and diverting Recreation. *Japanning*, I confeſs, is not ſo ancient, eſpecially in theſe parts of the Globe, therefore to be eſteemed (as indeed it is) the more rare and conſiderable; as for the reſt (too tedious to enumerate in a ſhort Epiſtle, tho' ſome of them have been long in uſe) Time and Induſtry have better improved them to Advantage, ſuch as are induſtrious, to employ their Talents for the good of themſelves, and others. And ſo the whole WORK, not comprehending many Sheets; I ſhall omit what more I juſtly might ſay; and ſubmitting to the cenſure of the *Candid* and *Ingenious Reader*, take leave to ſubſcribe myſelf

His moſt Humble Servant,

C. K.

THE

THE
Curious ART
OF
DRAWING,
AND
Preparing for *Limning*, and *Painting* in OIL, &c.

The *Introduction* to the *Practice*, in ſome Things neceſſary to be provided, for the proceeding in this ART.

THE curious Art of Limning or Painting in oil, has in all ages been wonderfully admir'd and approv'd, as the maſter-piece of other arts and ſciences, wherein art ſo exactly imitates nature, that motion only ſeems to be wanting; and many ſuch rare pieces have been drawn, that they have at the firſt bluſh, deceived the eyes of the curious, who have taken them for real living beings; and tho' the eye and hand are mainly required herein, the one to direct and the other to operate, yet the mind or imagination muſt furniſh out a great part of the curioſity, having ideas of the true ſhape of things always in a readineſs.

This cannot be done haſtily, but muſt be done by a ſteady practice and curious obſervation; the firſt thing in this undertaking, is to furniſh yourſelf with ſuitable materials, and amongſt others, French chalk red and white, that it may be cut into curious taper pencils, to draw the out-ſtrokes of any figure you deſign; Sallow-wood ſo burnt that you may do the like by it, and if theſe ſtrokes hit not at firſt to due proportion, they may be rubb'd out with the feather of a Mallard's wing, and ſo till you find them right; then go over your ſtrokes with a ſtrong well pointed pencil, either of red or black lead. To make the impreſſion more even and regular, it will be proper to have pens made of Raven or Crow quills, to finiſh the finer ſtrokes, alſo a rule and compaſs with three feet, to take in and out at the points, as you have occaſion, the one of white or red chalk, the other of black lead, and a third of any other paſtil, and theſe in moſt drawings are proper to mark out equal diſtances after the drawing of the out-ſtrokes. There are other things required, which in their proper place I ſhall ſpeak of.

Being thus far entered, come a little nearer to the practice, and make your entrance on it with plain geometrical figures, ſuch as are the circle, ſquare, oval, cone, triangle, cylinder, which at firſt uſe yourſelf to mark out with your rule and compaſs, till you can readily do it with your hand, and theſe will much aſſiſt you in the beginning of this curious undertaking: The circle well made, will direct you in orbicular forms, as the globe of the Earth, Spherical World, Moon, Sun and the like, is very proper in confining the picture you are to copy; the oval gives you directions for the mouth and face, the foot of a wine-glaſs, the mouth of a well, and the like; The cone aſſiſts in drawing columns, ſpires, tops of towers, ſteeples, &c. The triangle is of admirable

rable uſe in making the half face; the cylinder gives you aſſiſtance in drawing columns, pillars, pilaſters, and other things belonging to architecture; the poligon may be alſo uſed for ground plats, fortifications, &c. and angles and arches in proſpective.

Theſe things premiſed, try to draw ſeveral ſorts of fruits and flowers, as grapes, cherries, peaches, apples, apricots, tulips, pinks, &c. alſo inſects, trees, branches and the like, and from theſe proceed to practiſe on birds, beaſts, &c. Conſider well their proportion, colour, ſlowneſs, ſwiftneſs, fierceneſs, and many other things natural to them. And the better at firſt, till your mind can well frame ſuch ideas, it will be proper to have good drawings to imitate, and ſo go on by degrees, and other things, as fiſh, melons, roots, oranges, &c. and by no means miſtake their ſuitable lively colours, nor proper form, and then you may venture on human faces and bodies, wherein lies the excellency of this art.

Of Drawing Faces, &c.

When you come to draw a face, you muſt well weigh and conſider in what poſture it muſt be done, whether ſideways, upward, forward or downward, touching lightly the features, where the noſe, eyes, mouth, and chin ought to ſtand, then go more perfectly over them, for the circles, ſquares, and triangles uſed in this matter, may ſufficiently guide you where the noſe, eyes, mouth and chin ſhould ſtand; but in taking the features, obſerve with a ſtedfaſt eye the principal muſcles in the face, which in perſons of years appear very much; and there is uſually to be obſerved a three fold proportion in a face, as in the firſt place, from the top of the forehead to the eyebrows; in the ſecond place, from thence to the bottom of the noſe; and laſtly, from thence to the bottom of the chin; obſerving in this caſe a due proportion in the length of the forehead and noſe.

In a full face, the diſtance between the eyebrows conſiſts of the length of one eye, but where there is a ſide, or three quarter face, the diſtance muſt be leſſened, anſwerable to the proportion, the noſtrils muſt be placed directly againſt the nether corner of the eyes, and if the face you draw be plump or fat, the cheeks muſt ſwell; but conſider in a lean face, the jaw-bones ſtick out, and the cheeks fall ſomewhat in.

In a ſmiling countenance, the corners of the mouth turn ſomewhat upwards, and in a ſour frowning countenance, the forehead is bending, and wrinkles appear on the upper part of the noſe.

In drawing a fore-right face, you muſt make a perfect oval, divided by two lines, into three equal proportions; in the firſt part place the eyes, in the ſecond the noſtrils, and in the third the mouth, keeping the eyes an equal diſtance from each other.

In drawing an upright head, you muſt make it in equal diviſions, with three lines every way, either upwards, downwards, higher, or lower, divided as the former.

To draw the ſhortened or inclining face, obſerve how the lines agree, and ſo in their proper places you may draw the mouth and noſe, and the reſt of the parts after you have brought your hand a little into practice; and note, whatſoever proportion the face bears, your out-ſtrokes muſt be formed accordingly.

As for the noſe, you muſt, among other things, particularly obſerve the roundneſs, hollowneſs, and indentings of the noſtrils.

As for the hands, their poſtures are various; but a true meaſure muſt be obſerved in it, according to the proportion you draw; as likewiſe the arms, as far as they appear bare, then proceed to draw the feet with meaſure, and without, but for theſe it will be requiſite to get drawings to practiſe on at firſt, then practiſe drawing feet and legs, conjunct or ſeparate, and proceeding from the members, draw the other parts of the body, and practiſe firſt on a child, wherein there is more eaſe, becauſe they are of a fatter and plumper face and body, the ſinews, lines and muſcles, not appearing as in men and women.

In drawing, begin at the head, and ſo proceed by degrees to the feet, running it lightly over at the firſt, and as you ſee occaſion, encreaſe the fulneſs; Let the parallel joints and ſinews be equally proportioned, as alſo the muſcles, and their attendants, and exactly oppoſite, and the motions of the body be anſwerable to each other, and the limbs a true ſymmetry, one not being larger than the other, nor longer where nature requires it not.

In ſhadowing, obſerve to caſt them ever one way, as in the figure of a woman, if you begin the ſhadow at the left cheek, you muſt continue the like on the left ſide of the neck, body, and all other parts, unleſs the light ſide of it requires to be dark, by reaſon ſome other body ſtanding between the light and it, as put the caſe three men ſtand together, the middle figure muſt be darkened by the foremoſt, unleſs the light by facing it comes between them.

Obſerve that all ſhadows, the further off they are, grow fainter; and circular bodies muſt have a circular ſhadow, according to the light that makes it.

In drawing a figure ſtanding, draw that leg the body ſtands firm upon, ſtrait and ſteady, or elſe the figure will ſeem to decline, as if it were falling.

As in naked figures, the out-lines are required to be drawn firſt, ſo do it in drapery or cloathing, leaving ſpaces within for your greater or leſſer folds, and break them into leſſer, that may be contained within them, and the cloſer the garment fits to the body, the ſmaller and narrower muſt be the folds, and in ſhadowing the innermoſt it muſt be the harder, and the outermoſt the ſofter, continue the great folds, but as for the leſſer, break them off where occaſion requires it; and the finer the drapery is, the finer and ſharper muſt the fold be, and the ſhadow the ſtronger and finer to the eye, always obſerving, that the garment that fits cloſe, as the body-coat of a man, or breaſts of a woman, and the like, require no folding, but rather with a ſweet ſhadow repreſent that part of the body, that the garment appears to cover, as womens breaſts, with a ſweet round ſhadow, and the like.

Of Colours uſeful in Limning, or Painting, and other Matters.

The next thing to be conſidered, the cloth primed, and the drawing put on, is the preparing your colours, which in oil-painting muſt be with linſeed oil, unleſs for linen, and then walnut is a great deal better, for it will not turn yellow as the other in time will, when mixed with curous white.

You muſt grind your colours on a ſtone with a muller, till they are as fine as butter, *&c.* The colours proper to be uſed in Limning, are

The blacks; ſea-coal-black, ivory-black, lamp-black, and earth of collen; the white, white-lead; the green, terravet, verditer, and verdigreaſe; the yellow, ſpruce oaker, pink or piement, and maſticot; the blues, ſmalt, biſs, indico, and ultramarine; the reds, red-lead, vermillion, lake, indian red, carmine, and ornatto; the colours indifferent are, umber, ſpaniſh brown, burnt ſpruce.

Theſe are the chief to be laid in oil, but ivory, ſpruce oaker, and umber, muſt be burnt before they are ground; and as for maſticot, ultramarine, vermillion, ſmalt, and orpiment, you may temper them on your pallet without grinding, tho' grinding is better, becauſe it mixes them the better with the oil, and makes them dilate and ſpread more eaſily: And what of theſe are to be burnt, perform it in a crucible, taking care they be not over burnt, to loſe their tincture.

Take care in the next place to get ſome good pencils of all ſizes, proportionable to your work, a pallet or board to lay colours on whilſt you are uſing them, an eaſle to place your cloth upon, or againſt, and a ſtraining frame, to which it muſt be nailed, a moll-ſtick or ſtay, made of brazil, or ſome ponderous wood, not ſubject to bend, about a yard long, at one end tie a ball of ravell'd cotton, with a leather over it, ſo that with your left hand holding it againſt the work, you may ſupport your right arm with it, whilſt you are working.

Of Mixing or Tempering of Colours.

To make a violet-colour, take indico, white-lead and lake, mix them well, and the more or leſs quantity of each will make it deeper or lighter.

A lead-colour, make of white and indico, well mixed and tempered together.

For a ſcarlet-colour, take lake, red lead, and a ſmall quantity of vermillion.

For a flame-colour, take red lead, and maſticot heightened with white.

For a light green, take pink and ſmalt, and as you ſee occaſion, lighten it with white.

For a purple colour, take ſpaniſh brown, indico, and white, well tempered together.

For a bay-colour, mix ſpaniſh brown and white.

For a murrey-colour, mix lake and white: And ſo by often tempering colours, and practice, you may find out the reſt.

Of the firſt Operation or Sitting.

Having thus far proceeded, it will be time to begin your work, and having laid your ground for the general complexion, and drawn the outlines, which you muſt do with lake and white mingled, drawing very faintly, that if there be any fault, it may be rubbed out, and amended; the proportion of the face drawn, add to the former colour a ſmall proportion of red-lead, tempering it faintly to the colour of the cheeks and lips, the tip of the chin and ears, about the eyes and roots of the hair, placing red ſhadows; and the ſhadows muſt not be put in with the flat of the pencil, but with ſmall touches, after the manner of etching; and this wiſe go over the face, and cover the ground-work with theſe and the like ſhadows; but in the dead colours, your curioſity need not be great, only ſtrive as near as you can to imitate nature, for the roughneſs of the colours may be mended at the ſecond operation.

Having duly placed and proportioned your red ſhadows, proceed to put your faint blue ſhadows about the corners of the eyes and balls, *&c.* and the greyiſh blue under the eyes, and about the temples, working them ſweetly and faintly over, by degrees, beginning the ſhadow as the light falls, as likewiſe the hard ſhadows on the dark ſide of the face, under the eye brows, chin, noſe, and neck, with ſtrong touches on thoſe places, ſo paſs to the light ſide of the face, and bring all your work together to an equal roundneſs; yet at this time give not perfection to any particular part, but well view the work, and conſider how near you come to the life, not only in likeneſs, but poſture, colouring, *&c.*

Having now wrought the faint ſhadows into the red ſhadows, you may take a touch at the hair, diſpoſing it in ſuch curls, folds, *&c.* as beſt contribute to grace and ornament, only drawing it with colours ſuitable to the life, and deepen it ſomewhat more ſtrongly in the deepeſt-ſhadowed places, and ſo deſiſt from your firſt operation.

Of the ſecond Sitting or operation.

The party to be drawn in this ſecond ſitting, muſt take the place and poſture as before, and now you muſt take a more curious ſurvey of the lines and features, and as you drew them over roughly before, now is the proper time to ſweeten them with the ſame colours, by working and drawing them one into another, ſo that no rough edge, or lump of colour may appear; and you muſt do this with a pencil ſharper than the former, to render the ſhadow ſmooth and ſoft.

This done, proceed to the back-ſide of your picture, and if there be a curtain required, and it be ſuppoſed of blue ſattin, then temper blue with your oil, and draw the out-lines of the curtain, as alſo your picture, and lay it over very thin and airy with a large pencil, that it may be the whole ground intended to be done with blue, and then lay it over again with a ſubſtantial body, with the ſame colour, doing it ſwiftly, that no part of the colour may dry before it be all finiſhed. And in the ſame manner you may lay the backſide with any colour.

This done, lay your linen of a fair white, and your drapery flat, with the colour you intend it; then view the face again well, noting what ſhadows are too light or too deep, and labour to reduce the ſeveral ſhadows to their perfection, then draw the lines out of the eye-lids, and ſhadow the entrance into the ears, the deepneſs of the eye-brows, and all the moſt material marks and notes in the face; do this with a curious ſharp pencil, then heighten the hair, deepening it as it appears in the life, caſting over the ground ſome looſe hairs, which will not only make it look airy, but ſeem as if the picture ſtood at a diſtance from the curtain.

In ſhadowing the lines, which muſt be done curiouſly, uſe black, white, and a little blue, deepen the black with ivory-black, and put to it a little quantity of indico or lake, and ſo the ſecond operation is finiſhed.

The third Sitting or Operation.

Herein where you find any defect, or judge it reaſonable, you muſt give ſtrong touches, taking curious heed for the rounding of the face, which will now be better accompliſhed than before, obſerving diligently what yet may conduce to ſimilitude, as moles, ſcars, caſts with the eyes, drawing of the mouth, and the like.

For Garments or ornaments, the ground for blue being laid with bice, the deepening muſt be indico and a little lake, the lightening white, very fine, faint and fair, and for the greater ornament, the light may be mixed with ſilver or gold, but of drapery more particularly in metzotinto painting; for pearl colour, the ground muſt be white and indico,, and the ſhadow, pink and black; if the body requires to be in armour, let leaf ſilver be the ground, and when it is well dried and burniſhed, work the ſhadow with ſilver, umber and indico, and the ſhadow on the ſilver, as the life directs.

For gold armour, lay ſhell gold for the ground, or liquid gold, and ſhadow it with lake, engliſh oaker, and a mixture of gold.

For Drawing a fair Complexior.

To do this, make a mixture of a ſmall quantity of white, and twice as much lake and vermillion; temper them well with the flat of a knife upon the pallet, and let it be uſed as the deepeſt carnation in the face; then adding a little part more of white, reſerve that for a lighter carnation, and yet a third part being reſerved, add more white to it till it comes to the lighteſt colour in the face, and ſo proceed to prepare the faint ſhadows.

In doing this, take ſmalt and mix it with a little white, which may conveniently ſerve for the eyes, then ſeparate the greateſt quantity, and add to the reſt a little pink, and theſe well tempered will be ſufficient for the greeniſh ſhadows in the face, then proceed to prepare your deep ſhadows;

dows; do it with pink, ivory-black, and lake, a like quantity of each, temper them well together, and if the complexion you draw, requires redder ſhadows, add more lake; if bluer or greyer, more black; if yellower more pink.

Having prepared your pallet with ſuitable colours for a fair face, conſider again what other colours are required; if the complexion be more brown or ſwarthy, in ſuch caſes temper the colours as before, putting a little quantity of burnt oaker amongſt the lake, and vermillion and white, that it may amongſt other heightened colours appear tawny; and in this caſe temper ſo much oaker as will juſt turn it; and for your very deep, and very faint ſhadows, uſe the ſame as for the former complexion.

For a tawney complexion uſe the ſame as before, however prepare the ſhadows of burnt oaker and umber.

For a very black or dark complexion, prepare the ſhadows as the foregoing, but as for your lightening, take lake, burnt oaker, with white and black, however but a little of the white muſt be put in at firſt, that by degrees it may be the better worked up, and obſerve that the ſingle ſhadows laid at firſt upon your pallet, and well tempered according to the foregoing directions, ſerve as ſhadows for all complexions.

Further Directions for colouring Garments, &c.

Theſe garments or drapery, require to be made ſuitable to their colours; for red therefore lay the ground with vermillion, glaze it over with lake, and heighten it with white.

For ſcarlet, let vermillion be the lighteſt, deepened with lake, and heightened with indian red.

For crimſon velvet, lay a ground of burnt oaker, vermillion and indian red, glaze it with lake, and touch it up with vermillion.

For a ſad red, heighten indian red with white, and deepen with black, pink and lake, well mixed together.

For green, heighten bice and pink with maſticot, and deepen it with pink and indico.

For green velvet, lay the dead colour with a little white and lamp black, glaze it with verdigreaſe, deepened with pink and indico, and heighten with white and pink.

For yellow, uſe maſticot, umber, and yellow oaker, lay the dead colour with maſticot and white in the higheſt places, and with oaker in the meaneſt, in the darkeſt with umber, glazing when dry with pink.

For blue garments, take indico and white, firſt laying the white in its due place, and then your mean colour, viz. indico and white, well tempered in their proper places, then deepen with indico, and when dry glaze it with ultramarine.

For black garments, let the dead colour be lamp black and a little verdigreaſe, and go over it when dry with a little ivory black, and when you have heightened it with white, go over the work with verdigreaſe and ivory black.

For orange colour, mix lake and red lead, laying the lighteſt part with red lead and white lead, the mean part only with red lead, and the deeper with lake; and if it be neceſſary you may heighten with white.

For a cloth colour, let the ground be umber and white, and for the deeper ſhadows black and umber; for the mean, oaker and umber, and heighten it with oaker and white. And ſo much for colouring garments.

Inſtructions how to frame and paint Landſkips.

In this work of painting with oil, begin with the ſky and ſun beams, and the lighter parts, and then the yellow, which muſt be done with maſticot and white; the next your blue ſky, with ſmalt, leaving no part of the ground uncover'd, but lay the colours ſmooth all over, working the ſky downwards towards the horizon, ſtill ſuffering it to go fainter as it inclines nearer to the earth, and work the tops of mountains and other objects very remote, ſo faint as they may appear loſt in miſt and air, and as for the neareſt and loweſt ground, it muſt be a dark brown earth-colour, inclining a little to yellowiſh and green, as the nature of it requires, the next a light green, and ſo proceed gradually; as they loſe in their diſtance you muſt leſſen their colour, obſerving not to make any thing that is to be ſeen at a great diſtance, perfect or really, becauſe you muſt imagine it is at ſuch a diſtance that you cannot well diſcern it; but expreſs it in colours weakly and faintly, as your eye judges it may be, always taking notice to place the light oppoſite to the dark which will very much extend the proſpect, and do it ſo that the ſhadows may loſe in their proportion of diſtance, their force by little and little, as they remove from the eye, obſerving always to put in the ſtrongeſt ſhadows neareſt; put no moon nor ſtars but in a night piece, for they are not otherways naturally proper, becauſe they cannot be well ſeen in the day; if you imitate an over-caſt ſky, where black clouds threaten a ſtorm, the ſhadows may be on the meeting parts of the clouds. This may be alſo done with colours mixed with water, wherein gum-arabick has been diſſolved.

If in any fair landſkip you expreſs the light of the Sun, always obſerve throughout the whole piece, that you caſt the lights of your trees, rocks, hills, buildings, ruins, and all other things expreſſed in that way; obſerve alſo to leſſen your bodies proportionably as they are nearer or farther diſtant, and carry it off ſo far that the earth and ſky, or water, ſeem to meet. Rivers as they run to a diſtance, muſt leſſen their ſtreams; ſo ſhips or boats, and the like.

As for living creatures, beaſts, fowls, and ſerpents, or inſects, you muſt conſider their proportion, ſhape, and colour, and get draughts or patterns, which will be bettet than printed directions; and theſe kinds being numerous, for brevity ſake, I muſt omit to treat of them.

To lay on Metzotinto Prints on Glaſs.

In undertaking this, curiouſly lay the prints flat-ways in warm water, of the fineſt and thinneſt paper, for that which is rough and thick will not do near ſo well, if at all; let them ſoak well, and your glaſs being very white and thin, go over it with Venice turpentine ſpread thin with a pliable knife, and dab it all over with your finger, that the turpentine may ſeem rough.

This done, take the ſoaked print, and lay it on a clean cloth ſmooth, then preſs it with another to take out the water, then lay it on a glaſs, the print next it, beginning at one end, ſtroaking outwards the part already fixed to the glaſs, that neither wind nor water may be retained between, to wrinkle it; then with a little ſponge, or your hand, wet the back ſide, and lightly by degrees, roll off the paper carefully, without making holes, eſpecially in the lights, which are the tendereſt, and when the print appears very plain on the back ſide, let it dry about two hours, then varniſh it over with turpentine or maſtic varniſh till you can ſee through it, and a night's drying will prepare it to be worked on with colours.

If you would have all the paper off, ſo that nothing but the print may remain, lay it as before, with oil of maſtic and a little turpentine, and a bruſh will fetch off the paper.

To paint Landſkips of Mezzotinto.

As for the poſture to do any of this work, the beſt is ſitting to a true light, your pencils muſt be fine, and in the firſt place, glaze all the places that require, and if you would have them ſo thin as they ſhould be, and ſoon dry, mix varniſh as they are laid on, and in four hours you may venture other colours.

In this work glaze the neareſt and greateſt trees, ground them with brown pink, or if you fancy them greener, uſe diſtilled verdigreaſe, and where the leaves and weeds that appear in ſome landſkips very ſprightly and extraordinary green, muſt be glazed with diſtilled verdigreaſe and dutch pink, the trees appearing farther off, with only the former; the hills, rocks, mountains, and trees, at the greateſt diſtance, glaze with ſmalt, a little lake, and verdigreaſe thinly mixed with varniſh, as for the ſkies, uſe ultramarine or fine ſmalt, mixed with thin varniſh, glaze it over two or three times with a large clean pencil, and nimble ſtrokes; if buildings, or ruins of buildings appear in it, finiſh them firſt. And the mixture of colours, for theſe conſiſt of yellow, black, white, and now and then a tincture of red.

To finiſh ground, trees and ſkies, begin with the neareſt and largeſt trees, do over the lighteſt leaves with white pink and a little ſmalt, and neatly do over the darkeſt and neareſt leaves with a little pencil dipped in varniſh; and thoſe trees you would have very beautiful, paint with a mixture of verdigreaſe, yellow maſticot and white, the darker parts with white verdigreaſe and pink, as alſo thoſe trees you glaze with verdigreaſe only, they being very light mixed with white.

As for the ſkies and foreſkips, if any clouds appear, let them be touched with varniſh, and a light colour made of white lake and yellow oaker, touch alſo with theſe the light parts of hills, likewiſe towns, and the remoteſt diſtance; then mix white and ſmalt, as light as conveniently may be, and paint over the ſky, add a tincture of lake for the dark clouds; let the colours lie even and thin, and when finiſhed, give it time to dry, to make it look more lively, ſet the picture againſt the light that the ſhadows may appear.

Of painting Figures this way, as Men, Women, &c.

In painting a face, where there are deep ſhadows, glaze and touch them thinly with brown pink, lake and varniſh, alſo the black ball, and white ſpeck of the eye, as you will be directed by the print, the round white ball muſt likewiſe be of a convenient colour; if the lips are to be of a curious red, glaze them with lake or caramine, and then begin with the dark ſide of the face, and paint the ſhadows with the colour more red than uſual; to do this, yellow pink, vermillion and white are moſt proper; and note, no varniſh muſt be uſed in painting fleſh colours, except in glazing the ſhadows, for the varniſh dries ſo faſt, that you cannot ſweeten the ſhadows of the fleſh.

After this give a few touches on the ſtrongeſt light of the face, as the forehead, top of the noſe by the eyes, chin and mouth, which colour muſt be made white with pale maſticot, or yellow oaker, and a little vermillion mixed, according to the complexion intended, then mix that colour a little darker, and lay it on all the face that before you had not very carefully painted; yet that for the mouthand cheeks muſt be ſomewhat redder.

Now with a fine clean pencil, that has been worn a little, hatch and ſweeten the fleſh colours and ſhadows ſweetly together, taking care to cleanſe your pencil as often as it is requiſite, ſo that whilſt the piece is moiſt and wet, you may regulate cheeks too pale, or any other defect.

If the complexion be ſwarthy, mix the fleſh-colour with white, brown or yellow oaker, and light red, with agreeable ſhadows: and by this means you may paint naked breaſts, bodies or hands, always being careful that your pencil be ſteadily guided, for the leaſt ſlip marrs the feature; and treſpaſs not on features and lines of a diſagreeing colour.

How to paint the Hair.

In this painting you have no occaſion to uſe colours or varniſh near ſo dark as the life, for the paint contributes to the darkening of it; as ſuppoſe you were to paint black hair, you mix black, red oaker, with a touch of light red or lake, and theſe may well produce an aſh colour, and the hair coloured with it will ſhew you a natural black; if you would make the curls ſtronger, er, with a lighter colour touch the lighteſt part, and the darkeſt with the contrary, which you may well ſee through, if the colours are not laid too thick.

Of painting Garments or Drapery.

If you are to paint cloth or drapery, in a broken colour, obſerve carefully its mixture; however you muſt make three degrees of that colour, one the proper colour, another more light, and the laſt darker, for it muſt be for the darkeſt folds, and the lighteſt for the lighteſt pleats, and that between both for the other parts.

With a worn pencil ſweeten the colour, ſo that the folds may lie hard, and if you intend to make a fringe embroidery, or the like, add to them ſhell, or powdered gold or ſilver; mix your minerals with gum-water, having a fine pencil to hatch or embroider the flowers; and touch the fringes and other embroideries before you glaze, after this manner, viz. I imagine the changeable draperies ground to be purple, and the light yellow, then muſt I take a fine pencil dipped in varniſh, and thinly touch all the lighteſt parts of the folds with yellow maſticot, if there be occaſion to repeat it, for it muſt be granted the colour muſt be very thin with varniſh.

When dry, I muſt glaze all over with lake, ſmalt or ultramarine, once or twice with varniſh, and ſo it muſt dry; and then I mix three degrees of purple colour, of ſmalt, lake and white, and lay them on as directed; and by theſe meaſures fitting your colours ſuitable to your intention, you may paint any other coloured drapery, which in this little book I want room to particularize.

The curious Art and Myſtery of Japanning.

To be a proficient in this art, ſeveral matters are required, and theſe you muſt conſider as ſuitable, not only in property, but goodneſs, that your coſt and labour may not prove in vain.

As two ſtrainers made of flannel, moderately fine; or of coarſe linnen, in the nature of a tunnel, for to ſtrain your lac varniſh, and the other for your white varniſh, and the firſt of theſe may ſerve for lackers, when your occaſion requires you to make them; beſides theſe there are required two tunnels of tin for the ſame purpoſe as before; glaſs bottles and vials ſmall and great muſt be in a readineſs to ſuit with the quantities of varniſh your buſineſs requires you to uſe, and gally-pots to put it in when you deſign to work; as alſo to mix your blacks in, when they come to be ordered with other things.

As for tools they are no leſs requiſite, for without them this Art would be inſignificant, and therefore to furniſh yourſelf with them, you muſt have pencils according to the greatneſs or ſmallneſs of the thing intended to work on; thoſe for the varniſh muſt be made of camel's hair very ſoft, and are of various prices, as to the largeneſs or fineneſs; likewiſe drawing pencils, placed in ſwallow, duck, or gooſe quills, as the fineneſs or largeneſs of the ſtroke requires, and the longeſt haired pencils are accounted the beſt in this matter, to ſmooth the work before it is varniſhed, or take off the knobs or grittineſs from the ground, or when it is varniſhed.

Tripoli is proper to poliſh this work with when varniſhed, being reduced into fine powder, and ſifted; as for linen rags, you muſt be provided with them, both fine and coarſe, to clear and poliſh this work, alſo olive oil for a clearing; as many of theſe things ſhall be directed hereafter, as they occur in due place in the work.

Several things neceſſary to be uſed in this Art, &c.

Of Spirit of Wine.

This is of main uſe in varniſhing, and if it be not properly qualified it will ſpoil the varniſh, and not be capable for want of ſtrength, to diſſolve your gums, to make them ſpread, and ſo conſequently lie uneven upon the work; and to know when this ſpirit is ſufficiently rectified, put ſome of it in a ſpoon, and put a little gunpowder in, and if it burns out, blows up the gunpowder, and leaves the ſpoon dry, then it is a good ſpirit; but failing in this, and leaving the ſpoon moiſt when the flame extinguiſhes it is not fit for your uſe.

Of Gum Animæ, Gum Lac, and Gum Sandarack.

To chooſe theſe well, as for the firſt, take the moſt tranſparent, cleareſt and whiteſt, which is the beſt.

The ſecond alſo, called ſeed-lac, chooſe that free from droſs, ſticks or duſt, large grain'd and bright.

As for the third, take that which is large, and very white, caſting the leaſt yellow, free from duſt and droſs.

Of Shell-lac, white Rozin, Bole-Armoniac, and Venice-Turpentine.

As for the firſt, that is beſt which is moſt perſpicuouſly tranſparent, will eaſily melt, and draw out with your fingers as fine as a hair.

As for the ſecond, and the laſt, chooſe for your uſe that which is the whiteſt and cleareſt.

As for the third, that is moſt fit for your purpoſe that is free from grittineſs or gravel, and is of a blackiſh red colour, commonly called French bole.

Of Gum Elemi, Gum Arabick, and Gum Copal.

As for the firſt, chooſe the hardeſt, and freeſt from dirt and droſs.

Chooſe the ſecond white and tranſparent.

As for the third, that is beſt for your uſe that is whiteſt, free from droſs, and the thick dark ſtuff incorporated with it.

Of Gambogium, Iſinglaſs, Benjamin, or *Benzoin, Dragon's Blood, &c.*

There are other things neceſſary in this art, and ought to be well choſen.

As for the firſt, the beſt is that of a bright Yellow, free from dirty thickneſs and droſs.

Chooſe as to the ſecond, that which is whiteſt and cleareſt, free from yellowneſs.

As for the third, the beſt is that of a bright red colour, much like to clarified black roſin, free from all droſs and filth.

The fourth, when the beſt, is of a bright red; free from droſs, it may be had as the others, at the druggiſts, but the prices I ſet not down, becauſe they generally riſe and fall.

Of Silver Duſt, Braſs Duſt, Green Gold, dirty Gold, Coppers, Powder, Tin, &c.

The ſilver duſt, the beſt is brought from beyond the ſeas, and is known from the counterfeit by being ſqueezed between your finger and thumb, giving a glorious luſtre, as indeed it does in the work.

Braſs duſt, by artiſts called duſt gold, is beſt made in Germany; the beſt is of a fine bright colour neareſt reſembling gold, try it as the ſilver duſt; as for the coarſe ſort, tho' it will work pretty well with gold ſize, yet it will not do ſo with gum water.

Green gold is a corrupt metal ſo called, it is very good in this work, for caſting a fading green colour.

Dirty gold is a corrupt metal, caſting a dark, dull, tho' ſilveriſh colour, bearing pretty well a reſemblance to dirty droſſy gold.

Coppers are of three ſorts, natural, adulterate, and artificial; as for the natural, being cleanſed, it may be ground without any mixture.

The adulterate is moſt fit for a ground, and ſerves commonly to lay other metals on, as in hetching or heightening gold or ſilver on; but the artificial is of a higher and brighter colour than either; There are alſo uſed in this art, thoſe called ſpeckles of copper, gold and ſilver, and divers other colours, differing in fineneſs, which may be worked as the artiſt fancies, either on the outſides of boxes or drawers, or on mouldings, and may be purchaſed ready done.

Of Colours proper in Japanning.

Some of theſe are called tranſparent, on which gold and ſilver are to be laid, or ſome light colour, ſo that by this means they appear in their proper colours, lively and beautiful.

Of theſe, for a green, are diſtilled verdigreaſe; for a red, fine lake; for a blue, ſmalt; have to grind theſe on a porphiry, or marble ſtone, grind with a mullet what quantity you pleaſe with ſmalt or verdigreaſe, with nut oil as much as will moiſten the colours, and grind them till they are as fine as butter, put then the colours into ſhells, and mix them with oil of turpentine till they become thin for uſe ; lay them on ſilver, gold, or any other light colour, and they will then become tranſparent, altering their lightneſs or darkneſs, according to that of the metal or colours that are placed under them ; this for a curious red, may be done with lake, but then uſe drying oil to grind them with.

If you deſign figures on the back of your table or boxes, as trees, birds, or flowers, thoſe may be done for white, with white lead ; for blue, ſmalt, mixing it with gum arabick water, and mingle them as you pleaſe, to make them lighter or deeper ; flake white is a very pure white, but the other will do for ordinary work ; and you muſt uſe either of theſe with ſmalt, or all other colours that have not a body of their own ; you may for a purple uſe ruſſet, fine lake, and ſea-green, and it may be done with other ſorts of reds and greens, and except tranſparent colours, all muſt be laid with gum water.

Seed Lac Varniſh, how to make it.

Your ground work is good rectified ſpirits, of which you may take a gallon, put it into as wide a necked bottle as you can get, that the gums may the better come out ; then of the beſt ſeed-lac add a pound and a half, let it macerate twenty four hours, or till the gums are well diſſolved, with often ſhaking to keep them from clogging together, then with flannel ſtrainers ſtrain it into a tin tunnel, placed in the mouth of the empty bottle, the ſtrainer may be made as before directed, and ſqueeze the droſs in the bag, and throw it away as of no uſe ; then let the varniſh ſettle, and pour it off into other bottles, till it riſes thick and no longer, then ſtrain the thick part, and ſettle that again, and keep the fine varniſh for your uſe, and this does as well, without the danger of attempting to boil it, which endangers firing the houſe, and the party's life.

Shell Lac Varniſh how to make it.

This in curious gloſſy pieces of work is not of value, but in varniſhed woods it ſucceeds: To make it, put to a gallon of ſpirit, a pound and a half of the beſt ſhell lac, order it as the former, and tho' it has no ſediment, it is proper however it ſhould be ſtrained, to take away the ſticks or ſtraws that may be in the gum, nor will it ever be fine and clear as the former, but turns in a few days to cloudineſs, yet it is fit for coarſe work, and is much uſed.

White Varniſh, how to make it.

Take an ounce of white gum maſtick, and an ounce of white gum ſandarack, three ounces of the beſt and cleareſt venice turpentine, gum elemi half an ounce, gum copal an ounce and a half, gum benjamin or benzoin and animæ of the cleareſt half an ounce, and half an ounce of white roſin; and the gums being ſeparated in their quantities provided, put the roſin and copal in a glaſs vial, with half a pint of ſpirits, that they may be diſſolved; and to the ſame end, in a glaſs bottle of three quarts of ſpirits put the venice turpentine, animæ and benjamin, and in another bottle the gum maſtick and ſandarack, in a pint and a half of ſpirits, then diſſolve the gum elemi in a quarter of a pint of ſpirits, powder very finely the animæ and benjamin, the better to diſſolve in the ſpirit, and then pour them off into one large bottle; let them ſtand to fine as the former, and then ſtrain them thro' a linen cloth gently, not hardly preſſing the ſediment, leſt you carry the grittineſs of the gums along with you, to injure the varniſh.

General Rules of Varniſhing.

This is a point nicely to be obſerved, or your labour and coſt may be in vain.

1. If you chooſe wood that requires to be varniſhed, let it be exempted from knots, very cloſe grained, ſmooth, clean, well ruſhed, and freed from greaſineſs.

2. As for your colours and blacks, lay them even, and exquiſitely ſmooth, ſweep all roughneſs off with your bruſh.

3. Keep your work ever warm, but not ſo hot to raiſe bliſters, or crack it, which nothing but ſcraping off all the varniſh can amend.

4. After every diſtinct waſh let your work be thoroughly dry, for neglect in this point introduces the fault of roughneſs.

5. After it is varniſhed let it lie by and reſt as long as your conveniency will admit, and it will be the better.

6. Ever take care to begin your varniſh ſtrokes in the middle of the table, or what you do it on, and not from one end to the other, and your bruſh being planted in the middle, ſtrike it to one end, then take it off and fix it to the place you began at, ſo draw or extend it to the other end, and ſo continue it till the whole plain be varniſhed over, and beware you overlap not the edges, which is when the varniſh hangs in ſplaſhes or drops on them; therefore to prevent it, draw your bruſh gently once or twice againſt your gally pot ſide.

7. When you have proceeded ſo far as to come to poliſh, let your tripoli be very fine, and the

finer the work, let it be ſtill the finer, and uſe fine rags, keeping your hand moderately hard upon it, and brighten or poliſh one place as much as you intend, ere you leave it and paſs to another, and always have regard, that you poliſh your work as ſmooth as you intend at one time, but if your conveniency will admit, let it reſt two or three days before you give the finiſhing ſtrokes after you have poliſh'd it, but come not too near the wood to make it thin and hungry, for then it will require another varniſh, or remain to your diſcredit.

8. Take a ſufficient quantity of tripoli at the firſt poliſhing, till it begins to come ſmooth, and ſo leſſen by degrees, and carefully obſerve there be no ſcratches or grating in it.

9. When you have a mind to clear up the work, waſh off the tripoli with a ſponge, and ſoak up the wet with a fair linen cloth, and with lamp-black mixed with oil, gently ſmear the whole face of it, let no corner nor moulding of it eſcape, that the whole piece may be freed, then with other linen, and a hard hand cleanſe it of that, and theſe things done, there will be an admirable gloſs.

For white work, let your poliſh be gentle and eaſy, do it nimbly, and clear it with oil and fine flour; and in exactly obſerving theſe rules you will prove an Artiſt.

Of Black Varniſhing or Japan.

Provide for this imitation of japan, a cloſe grain'd wood, well wrought off, ruſh it ſmooth, and keep it warm by a fire, but never ſo near as to burn, ſcorch, or bliſter your work, then add to ſeed-lac varniſh, as much lamp black as will at the firſt ſtrokes colour the wood; do it three times, permitting it to dry well between every doing, and alſo ruſh it well, and then with a quarter of a pint of the thickeſt ſeed lac, mixed with an ounce of venice turpentine, put in more lamp black, ſo much as may well colour it and with this waſh it ſix times, letting it ſtand twelve hours between the three firſt and the three laſt waſhings; then with the fineſt ſeed-lac juſt tinctured with the black, do it over twelve times, letting it dry between every time doing, after which let it remain for five or ſix days before you poliſh it.

At the end of that time, take water and tripoly, and poliſh it, having firſt dipped your cloth in water, and rub it till it gains a very fine ſmoothneſs and gloſs, but do not rub ſo as may any ways wear off the varniſh, which cannot be eaſily repaired; then uſe a rag wetted without tripoly, and clear it up with oil and lamp black, yet poliſh it not all at once, but let it have ſome days reſpite between the firſt and laſt poliſhing, and at leaſt three or four days.

White Varniſhing or Japan.

This muſt be curiouſly done without any ſoiling, and therefore you muſt be cautious of letting any dirty thing come near, whilſt you are doing it.

To begin this work, ſcrape as much iſinglaſs as will make it of a reaſonable thickneſs, or when dipping your pencil into it, it will with a ſtroke whiten the body which has been paſſed over with a bruſh, but let it be in neither of the extremes, too thick or too thin, then mix it with your ſize, whiten your work over with it, and when dry repeat the ſame, covering it from all manner of duſt before it is varniſhed; it muſt be whited three times, and dried between every one of them, ſmooth, and lay it as cloſe as you can to the wood with your ruſhes; then mix white flake with your ſize, only ſo that it may lie with a full and fair body on the piece, and whiten your work three ſeveral times with this, drying between each then make it with your ruſhes very ſmooth, but keep your diſtance from the wood.

In the next place, take white ſtarch boiled in fair water till it come to be ſomewhat thick, and when it is luke-warm, waſh over your work with it once or twice, drying between whiles, and let it then ſtand 24 hours, then take the fineſt of the white varniſh I have directed you to make, waſh your pencil in ſpirits, and waſh or anoint your work ſix or ſeven times, and after 30 or 40 hours do the like again, and if done with a dexterous hand, a better gloſs will be ſet on it, than if it had been poliſhed; but if it miſs of that gloſs, it is requiſite that you poliſh it; and in order thereto you muſt accommodate it with five or ſix waſhes of varniſh more than the former, and it muſt continue to ſettle well about a week before your poliſh it.

In poliſhing, your linen and tripoly muſt be of the fineſt, being neat and careful in this operation, your hand carried light and gentle, having your cloth neither too dry nor too wet, and clear it up with fine flour and oil.

Iſinglaſs Size; how to make it.

Break and divide an ounce of iſinglaſs into little pieces, put it into a glazed, clean and well covered pipkin, and let it for 12 hours ſoak in a pint and a half of fair water, then place it over a gentle fire, till it boils well at leiſure, and when the water is conſumed to a pint, let it ſtand to cool leiſurely, and then it will be a jelly, and may be uſed in the white varniſh, and other works, but make no more at a time than you will uſe, for in two or three days it will prove naught.

Red Japan; to make it.

The reds are properly three, viz. the common red, the deep dark red, and the light pale red.

In the firſt, vermillion is proper, mixed with the thickeſt of ſeed lac, warm the work, and mix your vermillion with the varniſh in a medium, carry it over in four times, permitting it to dry as the former, and if your reds be in a good body and full, ruſh it ſmooth, then with the ordinary ſeed lac varniſh waſh eight times, and after 12 hours ruſh it again, and for a curious outward covering, give it eight or ten waſhes with ſeed lac varniſh, and after five days poliſh it, and clear it with lamp black and oil.

Of the dark Red.

The common red laid as before directed, deepen it with dragon's blood mixed with your varniſh, and when it has a pretty good colour, go over it with lac varniſh, which will much deepen and ſtrengthen the colour; and in all things elſe, as to poliſhing and clearing, do as in the former red.

Of the pale Red.

To do this, grind white lead with a muller on a ſtone, and when it is finely done, mix it with ſo much vermillion as will make it a pale red, mix varniſh with them, and give the work four waſhes, and follow the preſcription of the common red, conſidering the after-varniſh will heighten the colour.

An Olive-colour'd Japan.

Take Engliſh pink colour, grind it with common ſize, and when it is like pap, mix with it a proportion of lamp black and white lead, and work it as in other japanning.

Cheſnut-colour'd Japan.

To do this, take indian red or elſe brown red oaker, grind it well, and mix it with ordinary ſize, and then grind a little white lead, extraordinary well with the ſmall ſize, mix with it lampblack, and ſo both with the indian red oaker, fair and well, incorporate them together; if the colour be too bright darken it with the lamp black, if too dark lighten it with white lead, and ſo bring the colour to your mind, conſidering always that your varniſh will heighten it.

With this waſh over your work, let it dry, and repeat it 'till your colour lie full and fair, ruſh it ſmooth, but not cloſe to the wood, unleſs you deſign anew to begin your work, and give it a ſecond varniſh, and in thre days give it a luſtre with ſeed lac, and when dry, fit it for poliſhing with white lac; varniſh and clear it with oil and lamp black.

Blue Japan.

To do this, grind white lead very fine, add ſmalt as finely ground, mix them with iſinglaſs ſize, the white lead grind with gum water, let there be a proportion of white and blue, and mix them well to the thickneſs of common paint, go over your work with it, and when it is well dry, proceed ſo three or four times, till the blue lies with a fair body, ruſh it ſmooth, and go over it again with ſtronger blue, and when dry waſh it with the cleareſt iſinglaſs ſize, having a new pencil for that purpoſe, then when it is dry, warm it by the fire and go over it with a pencil dipped in white varniſh ſeven or eight times, and ſo let it continue for a day or two, then waſh it as often as before, and ſo continue many operations at intermitted times, for a week at leaſt muſt paſs before you can well venture to poliſh it, and when it is poliſhed, clear it with oil and lamp black.

Note, That in no wiſe you mix your colours with iſinglaſs colours too ſtrong, leſt when dried they be apt to crack, fly, and ſpoil the piece: but when you lay your waſh of clear iſinglaſs, to keep your varniſh from tarniſhing, or ſoaking into your colours, then it is proper that it be of a full and ſtrong body.

Of Speckles, for the Adorning Japann'd Wood.

Mix ſo many ſpeckles as you have occaſion for, with ordinary lac gum varniſh, ſo much as when they are put into a gally pot, will fit them for working with a convenient pencil, but not ſo thick as colours, keep them ſtirring very well with a bruſh, and generally warm by the fire: This continue till you perceive the ſpeckles lie thick and even to your mind, ſo beautify them with three or four waſhes of varniſh, mixed with turpentine, and this, unleſs you intend to poliſh, will be ſufficient, but then you muſt give it after all this, eight or ten waſhings with the prime lac varniſh, drying between whiles, and then poliſh; and on this manner you may lay on all colour'd ſpeckles; but ſilver requires ſeed lac varniſh, and the beſt white varniſh, ere it can be brought to a good poliſh, but if not to be poliſhed, you may ſpare your varniſh.

To lay on Speckles in Japan Work, &c.

If you deſign to adorn your work with flowers, rocks or garments, *&c.* varniſh the places intended with a fine pencil, and through any ſmall ſieve, ſhake the colours you deſign, whilſt the varniſh is wet, and ſweep up in rock work all ſpeckles that ſtraggle on the edges, with a new dry pencil, lodge them on the ſides and top of the rock, which ſticking, will render the work more beautiful, and give it a ſhadow or reflection.

This muſt be done with all diligence, and no intermiſſion had till finiſhed, till once covered, and being once dry, operate again, and ſo one upon another ſucceſſively, to ſhape it to your mind ; and in ſweeping the ſpeckles, intermix not one portion of ſcattered parts with the other, that are of a different colour, but every parcel in the proper ſtation to beautify the better : At firſt when laid, it will look dull and heavy, but the ſecuring varniſh in a little time will add to it a pleaſant beautiful colour; and ſo you may do flowers, trees, garments, and many pleaſant things to adorn your work.

Wood, how to overlay with Gold or Silver.

To prepare this work, you muſt be furniſhed with parchment ſize, that is, the cuttings of parchment, boiled in fair water to a jelly, and when ſtrained and cooled, it will prove a ſtrong ſize.

When you are to uſe it, put as much as you ſhall want into an earthen pot, and make it hot, then as it is cooling, ſcrape as much whiting into it as will colour it, mix them well with a clean bruſh, and with this mixture white your wood or frame, ſtriking or jobbing your bruſh againſt it, that it may the better enter into the hollowneſſes of carved work, then give it reſt that it may dry.

This done, melt the ſize again, and put in more whiting to render it ſome degrees thicker and with this do over the frames ſeven or eight times, or as you ſee there is a neceſſity, and when it is dry open with a gouge no bigger than a wheat ſtraw the veins in the carved work that the whiting has ſtopped up, then with a fine wet rag and your finger, carefully ſmooth and water, plain it over, and ruſh it ſmooth when dry, if neceſſity require it; and in this condition it will well receive your gold or ſilver ſize. But before I proceed, I ſhall teach you to make theſe ſizes.

The beſt Gold Size at preſent in Uſe.

Take an equal quantity of the beſt French and Engliſh bole armoniack, grind theſe fine on a marble ſtone with fair water, then ſcrape into it a little candle greaſe, incorporate and grind all theſe well together, then mix a little quantity of parchment ſize with a double proportion of water, and the buſineſs is done.

The beſt Silver Size in uſe.

Grind fine tobacco-pipe-clay very ſmall, mix with it as much lamp black as will turn it of a light aſh colour, and to theſe add bits of candle greaſe, grind them very fine together, a mixture of ſize and water, and try theſe on the corner of the frame; if it be rough in burniſhing, put more oil or greaſe, and as near as you can bring it to a due temper, that it may work well.

To Size your Frames, or other matters.

To do this make the ſize blood warm, and with a fine bruſh ſtir it very well, till it is ſomewhat thin, go over the frames with it twice or thrice, yet touch not the hollow parts of the deepeſt carvings where the gold cannot conveniently be laid, for the yellow colour nearly reſembling firſt laid on, the fault will not ſoon be diſcovered; let it dry four or five hours, and then try the gold if it will burniſh on it, if not, alter the ſize, and do it over again.

To lay on the Gold, in order to Burniſhing.

Let your frame, or other matter intended, be ſet on an eazle, place the leaf gold on a cuſhion, to be held in your left hand with the pallat and pencil. You muſt for this work have a ſwan's quill pencil, or a larger of camel's hair, if the work require it, dip it in water, and wet no more of your frame at a time than will take up three or four leaves, make your beginning at the lower end, and ſo proceed upwards, laying on whole leaves, or half ones, as it requires; then wet ſuch another part of your work, and lay on the gold with your pencil, or cotton, gently preſſing it very cloſe; and having gilded the upright ſides, turn the frame, and proceed the ſame way with the ends, then ſurvey the ſpots and places that are omitted, and cut ſmall parts of gold to cover them, when wetted, with a ſmaller pencil than before; when it is ſo finiſhed, let it ſtand till the next day that time you leave off.

To Burniſh the Gold Work.

Take a wolf or dogs tooth, if you cannot get agates or pebbles formed into the ſame ſhape, and burniſh ſo much of the work as you deſign, leaving the ground of the carving untouched. and ſome other parts, as you ſee beſt convenient, which in reſpect of the burniſhing being rough, the better ſets it off, that which is omitted to be burniſhed muſt be matted, or ſecured with ſeed lac varniſh, or lacker; if you deſign it a deeper colour, then muſt your work be repoſſeſt, or ſet off with lacker, mixed with ſaffron or dragon's blood, or the colour called Ornator, and with a fine pencil dipped herein touch the hollowneſſes of the carving, and the veins of the foldages or leaves; if you fancy it is not deep enough, you may by a repetition make it ſo, and the work is done.

To lay on Silver Size.

Warm the ſilver ſize that is newly ground and mingled well with weak ſize, as you did the gold ſize, do it once or twice, and let it dry, and try the leaf ſilver, if it will burniſh on it, it is prepared for the work; but if it will not, make an alteration in the ſize, and for the reſt lay on the leaf ſilver, and do as you did by the gold, and it will anſwer.

Note, As farther rules, and ever obſerve them.

1. Let your parchment ſize be pretty ſtrong, keep it not long leſt it ſpoil.

2. Grind no more ſilver or gold ſize than juſt you have preſent occaſion for.

3. Ever keep your work clean from duſt, after it is ſized and gilded, or elſe in the burniſhing, it will be full of ſcratches.

4. Do not whiten or burniſh gold ſize in hard froſty weather, for then the whiting will be apt to peel off, and the gold flaw.

The ART of Gilding METALS.

To prepare the Gold.

Take Ducat or leaf gold, what quantity you deſire, obſerve to beat the ducat very thin, and put this gold, with as much quick-ſilver as will juſt cover it, into a gallypot, where let them continue half an hour, where immediately after the mixture, ſtir them with a ſtick, then ſtrain them thro' a piece of leather, ſqueezing with your hand till you have forced out as much quickſilver as you can induſtriouſly do, ſo that what remains in the leather, looks more like ſilver than gold, yet this only muſt be employed in gilding, after the following manner.

To gild with Gold, Silver, Copper, Braſs, Princes Metal, &c.

Bruſh firſt your metal well with a wire bruſh, wet it with water or beer, and bruſh on till the dirtineſs or filth be quite removed, that the gold may more cloſely join it; prepare then your quickſilver, by mixing it with a little Aquafortis in a viol, three or four drops of the Aquafortis to an ounce of the quick ſilver, quicken your work with it, viz. rub it over with a rag or your finger, till it appears all ſilvered or touched. This done,

Take your prepared gold, and with a ſmall knife, or iron tool proper to the purpoſe, ſpread or overlay the whole piece, omitting no part, give it two or three little heats before you give it a thorough heat, ſo that with a hair bruſh, like a comb bruſh, you may dab and ſpread your gold, theſe little heats making the quickſilver more ready to comply; then give it the thorough heat, which will compel the mercury or quickſilver to evaporate or fly away; then take it from the fire, and with a ſcrub bruſh, untouched with quickſilver, cleanſe it as at firſt; if you perceive any untouched ſpot of quickſilver, the gold muſt be laid on it again, when it is cleanſed with a ſcratch bruſh, and after this manner you may heighten the colour if you ſee it neceſſary.

To heighten the colour of Gold.

Take an equal quantity of ſalt, argol and brimſtone, mix them with as much fair water, as will cover the gilded metal when put into it; boil them well, and tying your gilded metal in a ſtring, plunge it in for a little ſpace, often plunging, and looking as often on it as you draw it out, and when the colour is heightened to your expectation, dip it in cold water, and the work is done; you may in the foregoing manner double or treble gild, till the gold enriches it to be of a laſting thickneſs, and colour.

To counterfeit Tortoiſeſhell.

To do this well, let the wood you intend to work on be very cloſe grained, clean and ſmooth wrought off, as pear tree, or the like; but if rough grained, you muſt prime it with whiting, as you are taught in black japanning, for coarſe grained woods, ruſh it ſmooth, and go over it with ſeed lac varniſh, the breadth of a ſilver leaf, which take up with cotton, and lay on it moiſt, as cloſe as may be; then waſh again, and place on another leaf of ſilver, and ſo continue till the wood is overſpread with ſilver, and when dry, ſweep off all the looſe ſilver with a hair bruſh, then finely grind Collin's earth, and mix it with gum water or common ſize, and with this, (having added more ſize or gum water than it was ground withal) ſpot or cloud the ground work, having a fine, true, natural ſhell by you to imitate, and when this is done, you will perceive ſeveral reds, lighter and darker, appear on the edges of the black, and many times lie in ſtreaks on the tranſparent part of the ſhell; to imitate this finely, grind ſanguis draconis with gum water, and with a fine pencil draw thoſe warm reds, fluſhing it in about the dark places more thick, but fainter, thinner, and leſſer of colour towards the lighter parts, ſo ſweetening it, that it may in a manner loſe the red, being ſunk in, in the ſilver, or more tranſparent parts.

When it is done and dried, give at leaſt ſix waſhes of ſeed lac varniſh, and when it has continued 24 hours, ruſh it gently, and when it is ſmooth and fit for the ſecond operation, grind gambogium very finely in an equal ſmall quantity, put theſe into as much ſeed lac varniſh as will ſerve to waſh it another ſix times, then let it ſtand 12 hours, and give it the third varniſhing, and with the laſt mixture waſh it ſo often, that the ſilver is changed to a golden colour, and the work is done.

To die Wood a curious Red.

The wood that takes this colour muſt be very white, and to begin it, put a handful of allum in a moderate kettle of water, and caſt your wood into it, and when well ſoaked, take it out, and put in two handfuls of raſped brazil wood, and when that has boiled well, put the wood in again, for a quarter of an hour's boiling, and it will take the colour.

To ſtain a curious Yellow,

In this caſe, take the knotty aſh or bur, that is very white, knotty and curled, ſmooth and ruſh it very well, and when it is well warmed, waſh it over with a bruſh dipped in aquafortis, then hold it to the fire till it deſiſts to ſmoak, ruſh it again when dry, and poliſh it, and varniſh it with ſeed lac, and it will be of a curious colour, not inferiour to any outlandiſh yellow wood; and if you put filings or bits of metal, as copper, braſs, *&c.* each metal will produce a different tincture.

To Stain or Die Wood Black.

Boil log-wood in water or vinegar, and two or three times bruſh or ſtain your wood with it when very hot; then take nut galls and copperas, bruiſe them well, and boil them in water, and with it waſh or ſtain your wood ſo often, till it be a perfect black; or rather ſteep it in the hot liquor if you can put it in, and the dye will penetrate the better. Read more of this in *Art's Treaſure*

To Dye or Stain Wood for inlaying of Flowers, or other things in Cabinets.

Get moiſt new horſe dung, and ſqueeze out the moiſture thro' a cloth, put it into ſeveral ſmall veſſels fit for your purpoſe, and diſſolve gum arabick and roach allum, each the quantity of a walnut, and with theſe mix reds, greens, blues, or any colour that is ſuitable to the work, ſtir them often three or four days, then take your wood, particularly pear tree for white, cut it into the thickneſs of half crowns, or ſo much as will ſuffice any inlayed work, and in a ſquare or length, according to your deſire, boil up the liquor or colours very hot, and put in the wood till the colour has well taken; ſome indeed you may take out ſooner, that the colour being leſs ſtrong, may the better agree with your party-coloured flowers, ſhading and the like.

To Dye or ſtain Ivory, Bone, or Horn, Red.

Soak fine lime about 12 hours in fair rain water, then pour off the water well from the ſettling thro' a linen cloth, and to each pint put half an ounce of raſped brazil wood, and having boiled your materials in allum water, boil it in this, and it will give a curious tincture.

To Stain Horn, Bone, Wood, or Ivory, Green.

Prepare your materials by firſt boiling in allum water, then grind the common thick verdigreaſe or ſpaniſh green, a moderate quantity, adding half as much ſal armoniack, and put them into the ſharpeſt wine vinegar, as alſo the materials you intend to ſtain, and keep them there till they have taken a good tincture.

To ſtain or dye Horn, Box or Ivory, a curious Black.

To do this, put ſmall pieces of brazil wood into aquafortis, and ſo continue them till they appear green, then waſh well your materials in them, and boil logwood in water, into which put them whilſt they are warm, and in a little time the ivory, *&c.* will be of a curious black, ſo that being poliſhed, it will look like ebony or japan; and if you would have any part for flowers or the like, remain white, draw them before ſtaining with turpentine varniſh, and the black will not touch them, and afterward you may fetch them, and clear up with oil and lamp black.

To ſtain Skins Green.

Bruiſe a good quantity of the leaves of nightſhade very well, diſſolve in the juice well ſtrained out about two ounces of allum, then put in half an ounce of verdigreaſe, ſuffer them to ſtand over a gentle fire 24 hours, then warm, dip in a bruſh, and ſtrike over your ſkins; let it dry, and repeat it till it has taken a pleaſant green.

An approved way to colour white Leather.

Theſe ſkins muſt be hung in lime or chalkwater, that the wool or hair may be entirely ſtripped off, and they become ſupple, ſtretch them forth on tenters, bruſh them over with allum-water very warm, and ſo tincture them with the colours you deſign, ſuitable to your purpoſe.

To put a curious Black on Leather.

Take two pounds of the inward bark of an old elder, the like quantity of the ruſt or filings of iron, put theſe into two gallons of rain water, and cloſe them tight up in a veſſel, and when they have ſtood about ſix weeks, put in a pound of copperas, let them ſimmer a conſiderable time over a fire, and after 24 hours ſtanding, and often ſtirring, pour out the liquid part, and go over your leather with it warm, and it produces a curious German black.

To colour Leather a bright Red.

Dip your leather firſt in allum water, and rub it well therein; then take ſtale urine, boil it till it is half conſumed, ſcum it well, and put to it an ounce of the beſt lake, raſped brazil wood two ounces, and an ounce of allum; add to theſe half an ounce of ſal armoniack, ſtir them well over a moderate fire two hours, pour off the liquid part, and bruſh over your ſkins with it, till it takes a good tincture, remembering ever to let the ſkins in all colours, dry well between each going over with your bruſh, and your expectation will be anſwered to a very conſiderable advantage.

A curious French Yellow for ſkins.

Take wood-aſhes and chalk, of each a like quantity, and when you have made a good ley with rain water, ſtrain out the fineſt part, and ſet it over the fire, then put in a ſufficient quantity of turmerick well bruiſed or beaten to powder,

der, and as much ſaffron as may give a lively tincture, let it ſtand over a moderate fire, but not boil, till it becomes pretty thick, and being warm, colour the ſkins with it.

For a deep Blue, or Purple.

Strain out the juice of elder berries, put to two quarts, an ounce of allum, half an ounce of ſmalt or indico, ſet theſe over a gentle fire, and when warm, bruſh your leather over with this compoſition.

For a Crimſon Velvet.

Diſſolve cake ſoap in fair water and bole armoniack, each three ounces, place it over a gentle fire till the liquor grows clammy; then put in a little handful of grains of cochineal, two ounces of red lead, an ounce of lake, a quarter of an ounce of vermillion and a little piece of indico; beat theſe over a gentle fire till they are as thick as the glare of an egg; then go over the ſkins with a ſoft bruſh dipt in it, till the colour ariſes to your mind.

To imitate Turkey Blue.

Take two ounces of ſmalt, a quarter of a pint of red wine, half a pint of vinegar, an ounce of white ſtarch; incorporate theſe over a fire, till they come to a moderate thickneſs, then ſoak the ſkin in allum water; add to the compoſition a pint of water wherein gum arabick has been diſſolved, and ſtir it well; go over the ſkins three times, drying them between whiles, and when well dried, poliſh them over, to make them gloſſy.

For a light Green.

Take the juice of the herb called Horſetail, add to it a little allum, verdigreaſe and copperas.

To cover or dreſs Skins with Gold or Silver.

Grind brown red with a muller on a marble ſtone, add to it a little water wherein chalk has been diſſolved, and lightly go over the ſkins till they look whitiſh, and before they are dry lay on the leaf gold or ſilver, a little lapt one over another, that no ſpace be found wanting; when they ſtick well to the leather and are dry, poliſh them over with ſmooth ivory, or a horſe tooth, and it will give a very glorious luſtre. The ſilver you may go over with lacquer varniſh, and change it into a Gold colour.

Or another way, Take glare of eggs or gum-water, bruſh the Skins over with it, ſo lay on your leaf gold or ſilver, doing as before.

To make Skins ſhine without Silver or Gold.

Take gum water, the glare of eggs, and the powder of antimony, grind and mix them well together, and the ſkins being dry, lay it on with a bruſh three or four times, letting them dry between every time; then bruſh them over, and they will have a curious gloſs like ſilver, which tinctured with lacquer varniſh, will produce a fading gold colour.

To dye Briſtles a Red Colour.

Take half an ounce of allum, a quarter of an ounce of vermillion, and an ounce of raſp brazil wood; put theſe into a pint of vinegar, ſo boil them moderately thick, and dip in the briſtles when 'tis very hot; which continuing there ſome time, 'twill be a fine red. You may make larger quantities of the liquor with ingredients proportionable, and thus dye feathers.

Feathers or Briſtles Green.

verditer and verdigreaſe each an ounce,

put them into a pint of water, ſoak the feathers or briſtles in hot water, and then put them in this liquor boiling hot, and there remain until they have taken a good colour. According to the complexion of your dyes, you may make them this way of any colour.

For Blue, let your dyes be indico and bice.

For Black, galls and logwood, with a little copperas.

For Purple lake and indico.

For Carnation, ſmalt and vermillion.

For Yellow, yellow berries and ſaffron, diſſolving a little tartar in your water.

For Orange, Turmerick and red lead. And ſo of any other colour you fancy.

Of dying Silks, Stuffs, Cloths, Thread, and other things, of divers curious Colours.

To dye Silk a ſanguine Colour.

Take a pound of green wood, and as much allum, bruiſe them, then pour on them fair water, and half a pound of raſped brazil; ſet them over a gentle fire well to mix them, then put in the ſilk, ſuffering it to ſeeth therein, and ſo continue it, ſtrengthening your dye, and dipping till you perceive the colour has taken well; after that rince it in ley of wood aſhes or oak-bark, and ſo clear it with fair water, then dry and preſs it.

To dye Silk a deep Carnation.

Take white gall and allum, the herb called Foli well dried the quantity of a pound, two ounces of ſpaniſh red, four of indian lake; boil them in fair water over a gentle fire, and when they come to the height of tincture, dip your ſilks in them; and let them have good dippings three or four times, and the colour will take very well.

To dye Silk Quoins Red.

Let theſe be ſteeped in allum-water, then give them a gentle heat, adding in the heating bran-water, a pound and a half of green weed, ſo heat it up and put the ſilk into it, but let it not ſeeth, then rince it in ley of wood-aſhes, after that in water, then put in your logwood raſped or in powder, and ſo heat it up a ſecond time; ſo in thrice dipping, the buſineſs will be accompliſhed.

To dye a curious Yellow.

Take woad, the ſtalks, ſeeds and leaves, and lay them to ſoak in wood aſhes leys three hours, then ſeeth it till it is ſufficiently ſodden, and put it into a mixture of hot water and urine, ſo beat it up, and ſtrain the liquid part thro' a ſieve or ſtrainer, adding verdigreaſe, and ſo boil it up with the ley already ſod, ſtirring and well mixing the liquor about three hours, and when it is very hot, dip three times.

To dye Silk a Roſe Red.

Take to every four yards and a half you intend to dye, a pound and a half of nut-galls, boil them in fair water unbruiſed two hours, ſhift the water, then put in the ſilk or linen, letting it ſoak four hours, then wring it dry, and heat it in fair water wherein allum has been diſſolved, then put in half a pound of brazil powder, and a pound of green weed, and ſo by dipping in gentle heats the colour will heighten.

A good black Water for Silk or Cloth.

Take an ounce of lamp black, half a pound of nut galls, bruiſe the latter, and put them into a bottle of water, with a handful of the filings or ruſt of iron, beat them up, adding a quarter of a pound of copperas, ſeeth it to a third part conſumption, then add half a pint of gum water, and it will not only be fit for preſent uſe, but keep long, and be a very good black.

To dye Purple.

In this caſe if you dye ſilk, you muſt take to each pound of it an ounce of allum, and a gallon of water, diſſolving the allum therein over a gentle fire, then put in the ſilk, and let it continue there about four hours, then take lake and indico, each a quarter of a pound, a quart of urine, then adding a little handful of cochineal, heat them up into a dye, and dip your ſilks or fine ſtuffs into it as uſual.

To dye a very fair Blue.

Take any ſilk, ſtuff, or cloth white, and ſoak it in water, that done, wring out the water very well, and add two pounds of woad, a pound of indico, and three ounces of allum, give a gentle heat in fair water, and ſo dip till you perceive the colour to take well.

Carnation.

To make this a curious right colour, take dried purper, ſoak it in man's urine for a night, then take what you have to dye, and ſoak in allum water twice, ſeeth the purper in fair water, and then ſet another veſſel to receive the liquor, and dip therein.

For a pleaſant light Red.

Boil two gallons of wheat, and an ounce of allum in four gallons of water, ſtrain it thro' a fine ſieve, diſſolve more allum half a pound, and as much of white tartar; add three pounds of madder, to perfect the colour, and put in your ſtuff, cloth, *&c.* at a moderate heat.

Black for Velvet, &c.

Take half a pound of copperas, a gallon of ſmith's water, two pounds of galls, burnt ivory, oak bark, and ſhoemaker's black, each an ounce, well ground, two gallons of fair water, mix them well, and ſet them in the ſun or other warm place a month, often ſtir it, and at a moderate warmth dip your velvet, or other things deſigned for deep blacks.

To make Red Water for Silk or Woollen, Violet, & Green, Azure, or Yellow.

Take two gallons of fair water, four ounces of brazil, and being half conſumed in heating, remove it from the fire; then put in an ounce of grains, a quarter of an ounce of gum arabick, with a quarter of a pound of allum well bruiſed, and having ſtood all night, it may be uſed in the morning.

To dye Woollen Yarn, or Wool.

Take two pounds of woad to every four pounds of yarn, *&c.* and two gallons of water; put in two handfuls of wood aſhes, and when it ſeethes put in the yarn or wool, and let it continue half an hour or more, then wring it and put it in again, and let it ſeeth as long as before, and if it were a brown blue, it will be a dark green, or of a white yellow colour.

To make Bran-Water.

This is very neceſſary in dying, and therefore you ought to know how to prepare it. Do it with half a peck of wheat bran to two gallons of fair water, and half a pound of bruiſed allum, over a gentle fire; ſuffer it to ſtand about a week, often ſtirring it before you uſe it.

To make Grey Florrey.

Let the florrey be ſoaked 24 hours, then wring it thro' a cloth, and take aſhes of vine-ſprays, with them make a ley, and upon a table ſpread the florrey about two hours; put the ley into three veſſels, and ſhift the florrey out of one into another, and before you dip put vinegar in, ſo the florrey will be right, and your colour good.

To dye Linen with Crampenade.

To three ells of linen uſe a pound of the crampenade, and a gallon and a half of water; ſo to a greater quantity proportionable; ſet it over a fire till it begins to ſettle, put in at that time two ounces of galls, then your linen, and when you take it out, which muſt be often, wring it and put it into allum water, but if you would have the colour darker, it is requiſite to have a ley of unſlacked lime, or chalk-ſtone.

To dye Linen, Thread, or Cloth, a good Red.

Soak a pound of ſamfleur 24 hours, in two gallons of water, ſuffering it to heat over a gentle fire; add two ounces of vermillion, half a pound of raſped braſil, and an ounce of allum diſſolved in fair water, ſo dip and order as in other things.

Thus, Reader, have I given you a great Inſight into the Myſtery of dying Silks, Stuffs, Cloths, and other things relating thereto, which may by practice prove advantageous.

The ART of Perfuming.

To make Eſſence of Hypocras.

Take a ſtrong glaſs bottle, put half a pint of ſpirit of wine into it, add an ounce of cinnamon, half an ounce of cloves, a groſs of ginger, and as much coriander as you can hold with your fore finger and thumb well beat, three or four grains of black amber, or ambergriſe, beaten in a ſtone mortar; ſtop the bottle faſt, and ſet it on ſand, expoſing it in the ſun for a month. In this caſe, it muſt not be full, nor ſtand for rain to touch: This is a curious and wholeſome perfume.

Eſſence of Amber.

Put a pint of ſpirits of wine into a ſtrong glaſs bottle, then in a ſmall ſtone mortar beat a groſs or the eighth part of an ounce of black amber or ambergriſe, put it to the ſpirits with half a groſs of the bladder of muſk very ſmall; ſtop it cloſe, and ſet it for a fortnight, as the former, ſhaking it twice or thrice a day when the ſun ſhines hot upon it; then let it ſtand quiet another fortnight, and it is done.

Roſa Solis, or Perfumed Liquor.

Put two pints of water and two pounds of ſugar into a copper pan over a gentle fire, let them boil to the conſumption of a fourth part, then put in two ſpoonfuls of orange-flower water, throw in the white and ſhell of an egg well beaten with a whiſk, ſtirring it in the liquor; when it boils take it off and ſtrain it thro' a bag ſeveral times, and when you perceive it well clarified, pour in of the beſt brandy, then eſſence of hypocras or amber, and you'll have excellent perfum'd Solis.

Angel Water.

Put into an earthen pot a quarter of orange-flower water, a quarter of a pound of benjamin, two ounces of ſtorax, a quarter of an ounce of cloves, half an ounce of cinnamon, two or three bits of calamus; ſet the pot on a gentle fire to the conſumption of a fourth part, add a bladder of muſk, then let it cool; ſtrain it well from the droſs, and put it up for uſe.

Milleſleur, or the Water of ſeveral Flowers.

To do this, put in a ſtrong glaſs bottle a pint of angel water, then in a little mortar beat twelve grains of muſk, then put ſeveral flowers of various ſcents, more of the weaker than of the ſtronger, that there may be a temperature, and allay them with that water, and when well infuſed, pour it off into a bottle, and keep it well cloſed for uſe.

Orange-flower Water.

To make this well, infuſe two pounds of orange flowers in a quart of water three or four hours, and ſo diſtil them in a cold ſtill: This water is good for cleanſing ſnuff, making angel water, or perfuming waſh balls or ſkins.

The Queen of Hungary's *Water.*

Put a quart of the beſt ſpirit of wine into a ſtrong glaſs bottle, and two large handfuls of roſemary flowers, a handful of Thyme, and half a handful of ſweet marjoram, the leaves only, and as much of ſage, keep the bottle cloſe ſtopped, and expoſe it to the ſun a month, and then you may diſſolve the bigneſs of a bean of orcanat, bruiſing it with a little ſpirit of wine, and put it into the bottle: then expoſe it four or five days more to the ſun, and it will be of a fine red colour, and a curious ſcent.

Paſtils

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Paſtils

Paſtils or Perfumes, of divers Kinds.

Paſtils of Roſes made into Wax Candles.

Take a pound of the dregs of angel water, beat them when dry'd very fine, and ſearce them thro' a hair ſieve, then put to them a handful of the leaves of roſes newly gathered, diſſolve gum adragant in roſe water, and beat the whole long together, to well incorporate it, then roll up pieces as big as your finger taperwiſe, and when they are dry they will burn like a candle, and give a very curious ſcent.

Perfum'd Paſtils for Beads or Medals.

Diſſolve gum adragant and arabick in millefleur water, and put into it marchal powder as much as will ſtiffen it into a paſte, rub the moulds you caſt them in with eſſence of flowers, and the beads or medals will be of a curious brown or coffee colour.

Another.

Take of frangypan and cyprus powders, each a like quantity, put them in gum wherein millefleur water is the greater part, and make them into Paſtils.

To make a liquid Snuff, excellent for the cure of the Head Ach, or againſt Apoplectick Fits; a rare Secret.

Take diſtilled betony water a pint, half a pint of roſemary flower water, infuſe in theſe four ounces of the beſt Virginia tobacco, finely ſifted into powder; let them ſtand warm by the fire, or in the ſun 24 hours, then ſqueeze out through a very fine clean cloth the liquid part, ſcent it with a little ambergriſe, and a very ſmall quantity of muſk, drop into it three or four drops of chymical oil of nutmeg, or cinnamon, ſhake it well when the ſettings are taken off, and keep it in ſmall cloſe vials for uſe, ſnuffing or ſpirting up a very ſmall quantity at a time into your noſtrils. The ſcent of it, without ſnuffing up, cures an ordinary head ach.

Coſmeticks, or curious Receipts for beautifying the Face, Hands, or any part of the Body.

Benjamin Water, an excellent Beautifier.

Take a pint of good ſtrong brandy, a pint of ſpirit of wine, half a pound of benjamine, and a quarter of a pound of ſtorax, an ounce of cinnamon, and half an ounce of cloves, and four nutmegs; beat the ſpices and benjamine, and putting them into the liquids, ſtop them up cloſe in a ſtrong glaſs bottle, and let it ſtand upon ſand in the ſun, in the heat of ſummer a month, and then pour it off and clarify it.

This cleanſes the ſkin of morphew, Tannedneſs, or ſun burning, and cauſes a delicate complexion, as does the queen of Hungary's water, which I have already taught you to make.

To prepare Spunges for the Face.

Having choſe the beſt and ſmootheſt ſpunge, and cut off what is ſuperfluous, ſoak it, changing the water till it looks clear, then dry it, and dip it in orange flower or angel-water, pour over t a little eſſence of amber, then ſqueeze it but a little and let it dry, and it will be for your purpoſe, in cleanſing and beautifying the ſkin, far beyond the uſe of linen.

To cauſe a fair Complexion.

Diſtil Fumitory, roſemary flowers, and ſcabious,

ous, each two handfuls in a bottle of white wine, and a quart of dew gathered off the graſs or corn, with clean napkins and handkerchiefs, and ſo wrung out. Keep it cloſe ſtopped in glaſs bottles, and waſh the face and hands with it as there is occaſion.

To cauſe a fair Complexion.

Take oil of myrrh an ounce, three drops of oil of ſulphur, an ounce of the oil of ſweet almonds, mingle them well, and anoint the face going to bed, and the next morning take it off with benjamine water.

To make a clear pale Complexion.

Diſtil the bloſſoms of peaſe, beans and peaches, each a good handful, in two quarts of whey, and waſh the face with it.

A Pomatum to refreſh the Complexion, and take off Pimples and Redneſs.

Take half a pound of the leaf of a hog's fat, work it well in fair water till it is very white, then put it into a new earthen pan; put in a quarter of an ounce of copperas, two pippins cut in pieces without paring; mix an ounce of the oil of ſweet almonds, then ſtrain it thro' a linen cloth into clean water, and make it into pomatum, ſo with it anoint the face.

To take away Freckles.

Take the gall of a cock, an ounce of rye meal, a quarter of an ounce of the juice of hemlock, an ounce of oil of turpentine; make them into an ointment, and anoint the freckles with it, and in a little time they will diſappear.

A Pomatum to plump the Lips and Cheeks,

Take an ounce of freſh butter, and as much virgin wax, ſet them over a gentle fire, and throw in black grapes, bruiſe them with a ladle, then put in two ounces of orange flower water; bruiſe in a poringer the bigneſs of a bean of orcanet, allay it with a little orange flower water; put them into the pomatum, working them up together with a ſpoon, and then put it up for your uſe.

A liquid Paſte to waſh the Hands without Water.

Take of bitter almonds a pound, bruiſe them well in a ſtone mortar till no lumps remain; wet it with a little milk, and make it into a paſte; beat the crumbs of white bread with a little milk, and put theſe with the yolks of eggs without the treadle into the mortar to the paſte. Beat them up yet more, and then boil them till thick, and keep them up for uſe.

To take Spots or Stains out of the Face, Hands, or any part of the Body.

Take litharge of ſilver an ounce, the juice of lemon and a ſea onion each a ſpoonful, mix theſe with a quarter of a pint of white wine vinegar over a gentle fire, and apply a rag dipt in it to the ſpot, and often doing ſo will remove it.

To whiten the Teeth like Ivory.

Take bruiſed coral and pumice ſtone finely ſifted, and by rubbing the teeth well with them they will be as white as thoſe of infants.

To make Hair grow and curl.

Take the aſhes of fern roots a handful, as much of thoſe of the vine, and make a ley with them in ox urine, boil in it a handful of the tops of hyſſop, ſo waſh the ends and roots of the hair with it, or any bald place, and the hair will immediately grow and curl.

To take Spots and Stains out of Silks, Stuffs, Woollen, Linen; alſo Pitch, Tar, Roſin, Wax; and to recover faded Silks or Linen.

To take Spots or Stains out of Silks.

Take an ounce of flax ſeed, bruiſe it well in two or three ſpoonfuls of the juice of lemon; add a quarter of an ounce of white lead, and as much of burnt bone, mix them over a gentle fire to a thickneſs, lay them on the ſtrainer.

To make a Soap that will take Greaſe, Spots, or Stains out of Cloths, Silks or Stuffs.

Burn a pound of roach allum, and finely powder it; add to it half a pound of the root of an herb called Florence-flame, a new laid egg, and two pounds and a half of cake ſoap; bruiſe and mix them well together, that they may be made up with fair water into balls; then firſt waſh the place ſtained or ſpotted with fair water, ſcrape the ſoap moiſt on it, and waſh it out, and in three or four times thus doing, the blemiſhes will diſappear.

To take Spots out of linen.

Take two ſpoonfuls of the juice of an onion, and as much of lime juice, wet it two or three times, as often drying it by the fire; waſh it immediately in a good laver, and it is done.

A good Ley to take out Spots or Stains.

Put half a pound of ſoap-boilers aſhes into two pints of water, let them remain three days, with often ſtirring; then pour off the clear ley and mix it with fuller's earth; then lay it thick on the place, drying it in the ſun, or by a fire, and in two or three times doing it will anſwer your expectation.

To take Spots or Stains out of coloured Silks, Stuffs, Linen or Woollen.

Take pumice ſtone and grind it to powder, put to it ſharp vinegar and fuller's earth; let it lie on and dry, then waſh it out with milk and flower of almonds.

A Way to take out Tar, Pitch, or Roſin.

Dab on this oil of turpentine, let that dry and put on more. and the third time when it is dryed you may rub out the pitch, *&c.* for it will crumble like dirt.

To take out Oil or Greaſe.

Mix burnt bone and fuller's earth with a little white wine, and plaſter it on the ſpot, then dry it in the ſun, or by the fire, and it will ſuck out all the greaſe in once or twice doing.

Sweet Powders, Perfumes, &c.

To make Groſs Powder a la Marchale.

Take of iris ſixteen ounces, of dryed orange-flowers twelve ounces, coriander four ounces, a pound of province roſes, two ounces of angel-water dregs, an ounce of calamus, two ounces of ſouchet, half an ounce of cloves, beat them well one after another in a mortar, then mix them, and finely ſift them into one incorporated powder.

Powder of Jeſſamine.

To make this, mix about a thouſand ſprigs and flowers of jeſſamine amongſt twenty pounds of fine ſtarch in a cloſe box, lay them even, making a bed of flowers and another of powder, and let them lie 24 hours without touching; then ſhift the flowers, and put freſh ones (the ſame quantity) for three days, and the powder will be well ſcented.

Powder of muſked Roſes.

To do this well, you muſt put the muſked roſes into the powder, and leave them there twenty four hours in a cloſe box; ſo you muſt ſhift them three times, and they will give an excellent ſcent.

Powder of Orange Flowers.

Mix a pound of good ſcented flowers with twenty pounds of ſtarch, or rice grounds, mingle them and ſift them twice a day at leaſt, for theſe are ſubject to heat, and in twenty four hours you muſt ſhift the flowers, and put the ſame quantity of freſh ones in, and ſo continue till there is a good ſcent. Keep it always cloſe unleſs when you uſe it.

Powder of Violets or Iris.

In this caſe beat the iris, and paſs it through a ſieve; mingle it with the powder, and it gives the natural ſcent of a violet.

Powder of Amber.

Mix jeſſamine, roſe, and muſk powder together, each a like quantity; then mingle with them the eighth part of an ounce of the eſſence of amber; then ſift the powder, but break not the lumps made by the eſſence till dryed, then ſift them in, and mingle them well; and in this manner with flowers, eſſences, &c. you may make what ſcent you pleaſe, Starch being the ground of theſe hair powders, which ſucks the ſcents, and retains it a very conſiderable time for uſe.

Waſhballs perfumed, &c.

To make common Waſhballs.

Take a pound of white cake ſoap, ſcrape it, and beat it well in a mortar, take out the crumbles that are not well incorporated, and put in a pound of ſtarch well powdered, an ounce of the eſſence of orange, half a pint of macanet water prepared, ſtir them gently with a peſtle, then beat till they are all well mixed, make the paſte up into balls, and let them dry.

Waſhballs of Neroli.

Take eight pounds of cake ſoap well cleanſed, put to it when ſcraped, as much of roſe or orange flower, as will temper it, ſtirring it twice a day, the better to ſoak; then having beaten it well, put in a pound of labdanum in powder, and two ounces of neroli; mix them into a paſte, and ſo make them into balls.

Bologria Waſhballs,

Take three bundles or boxes of theſe balls, beat them and dip them in angel water, as much as will well wet them, and half a pint of benjamine water, make two equal cakes of the paſte, by well beating, then beat very ſmall two drachms of muſk or civet, with two ounces of balm of Peru, drop'd in by degrees; add to theſe the groſs eſſence of amber, and ſome eſſence of cloves, and ſome cinnamon; mix theſe with the paſte, make it into balls, and keep it for a very curious perfume; and in this nature other waſhballs or paſte may be made, and perfumed with various ſcents. *Art's Treaſure.*

Sweet Bags to make.

Take of common roſe leaves twelve ounces, lavender flowers a pound and a half, ſweet marjoram leaves twelve ounces, four ounces of the leaves of myrrh, ſix ounces of thyme leaves, four ounces of mellilot leaves, one of roſemary, two of cloves, and one of muſk roſes, a good handful of citron and orange flowers; put them in a pot, making a ley of leaves and flowers, and another of ſalt, then ſtop it well, and every other day ſtir it with a ſtick, expoſing it to the heat of the ſun in ſummer, but not in the rain, and fill your ſweet-bags with theſe and powder.

To perfume Gloves, Fans, or Skins with Flowers, &c.

Grind on a ſmooth clean marble ſtone, two drachms of civet, add three drops of the eſſence of orange flowers, and other flowers, made with ben oil, add more, a few drops of millefleur water, grind by itſelf gum adragant, about the bigneſs of a hazel nut mixed with orange flower water; after that, mix your civet, dropping a little of the millefleur water; ſo do till all is well mixed, then put your compoſition into a mortar and pour more water, ſtir it till it comes to a quarter of a pint, lay it very even on your gloves, ſkins, &c. dry them in the air, open, and order them for colouring, and by this rule you may perfume them with any ſcents.

Roman Gloves, how to perfume.

Grind on a fine marble a drachm of civet, with a few drops of eſſence of orange flower water, then warm a little water, and infuſe in it a drachm of amber, with a few drops of orange flower water, pouring more to it by degrees, till all come to about a quarter of a pint; then mix again the civet with ſome drops of the ſame water, adding, till the whole comes to half a pint, and then perfume your gloves, ſkins, or fans with it.

How to colour and perfume Gloves, at once.

Chuſe what colours you like beſt, and grind them on a flat ſtone, with a little ben oil, or the eſſence of orange flower water by degrees, ſtill grinding; then put to the colours gum-adragant diſſolved in orange water; then being well ground pour all into an earthen pan with more water, taking the colours, being not too thick, and then dip a ſoft bruſh into it, and rub over gloves, ſkins or fans; let them dry in the air, then ſmooth and order them as is requiſite; grind a bit of your colour with a little piece of gum-adragant infuſed in orange flower water, and very clear, rub them over with this, and it will keep the ſcent a long time.

Several ſorts of Snuff, ſolid and liquid, how to make and perfume them.

To prepare and cleanſe Snuff.

The ground of it is tobacco dried into powder, that it will ſift curiouſly through a fine ſieve, and then it requires briefly to be waſhed and cleanſed in the following manner.

Soak it in fair water twenty four hours, then take it out, and ſqueeze it very well in a cloth, dry it in the ſun in wicker hurdles, over which a fine linen cloth is laid, keeping it turning, and ſtirring almoſt continually; being dried, ſprinkle ſweet water on it, as orange, jeſſamine, angel, or the like, then dry it again, and wet and dry it three times, by which means it will be capable to take the impreſſion of any ſcents by being ſprinkled on it, or infuſed; but if you deſign to colour it red or yellow, it muſt be done before it is ſcented, eſpecially for flower ſcents, it may be coloured with red or yellow oaker.

To perfume Snuff with Flowers.

The flowers moſt uſed in this, are jeſſamine, orange, muſk roſes, common roſes, tuberoſes, &c. But theſe if uſed naturally, muſt be helped with the eſſence of other flowers, or the ſame; to do this, get a wooden box large enough for your purpoſe, lined within with dry white paper, lay a laying of ſnuff and a laying of flowers, and let them ſtand twenty four hours, then ſearce or ſift the ſnuff, to take out the flowers, and renew them with other flowers; continue it four or five days, then ſeparate it, and keep it in cloſe boxes in a dry place for uſe.

Snuff with Spaniſh Perfume.

Take a pound of ſnuff that has been perfumed with any ſort of flowers, beat in a mortar twenty grains of muſk, with a little lump of ſugar, ſo put in your ſnuff by degrees, gently ſtirring it about, and when the mortar is full, empty it gently, and cover it to keep in the ſcent as much as may be; then put in ten grains of civet, put in the ſnuff again, and mingle them well, and ſo keep it dry for uſe.

How to take Spots or Stains out of Scarlet or Velvet.

To do this, take ſoapwort, a herb of that name, bruiſe it and ſtrain out the juice, add a little black ſoap, mix them well to a moderate thickneſs, daub over the ſtained or ſpotted place, waſh it out with warm water, and ſuffering it to dry, do it again twice or thrice, and it will effect your deſire.

To take Iron-Moulds or Spots out of Linen.

Diſſolve the powder of burnt allum in the juice of lemon, wet the place with it, and dry it with the back of a ſpoon in the forepart of which is a live coal, and in doing it five or ſix times, the iron mould or ſpot will waſh out.

To recover faded Linen.

Heat a gallon of new milk over the fire, and ſcrape a pound of cake ſoap into it, and when the ſoap is well diſſolved, boil the linen well therein, and then clap it into a hot laver of water and other ſoap, waſh it out well, and it will recover its ſtrength and colour.

To make Powder-inks, as the London Powder-ink, &c. and Liquid Shining Japan-ink.

To make that which is called the London Powder-ink.

Take ten ounces of the cleareſt nut galls, bruiſe them, and ſift the powder very fine, then add white copperas two ounces, roman vitriol three ounces, gum arabick, or ſandarick an ounce, bruiſe and ſift them very fine, ſo that tho' they appear white, a little being put into water, will in a little time turn it, and an ounce of powder will make a pint of very black ink.

To make Japan or ſhining Ink.

Take gum arabick and roman vitriol, of each an ounce, galls well bruiſed a pound, put them into rape vinegar, or vinegar made of clear ſmall beer; let them remain in a warm place, often ſtirring till the liquor becomes black, then add to a gallon, an ounce of ivory black, and a quarter of a pint of ſeed lac varniſh, and it will be a curious black ſhining ink.

A Powder-ink to rub on Paper, and write on.

Bruiſe about twenty nut galls, and half an ounce of roman vitriol, as much gum arabick, and gum ſandarack, mingle theſe finely together, when well bruiſed and ſifted to a powder, rub the paper hard with it, with cotton wool, and poliſhing it with a piece of ivory, write with water, and in a little time the letters you write will appear a fair black, as if written with the beſt ink.

Receipts for the Cures of ſundry Diſeaſes and Grievances incident to Men, Women and Children.

For the Ague.

Take a little handful of the tops of rue, boil them in a quart of white wine, give the party half a pint, four times ſucceſſively, upon four cold fits approaching, if the ague laſt ſo long, and put the party into a warm bed: This muſt be drank as hot as the patient can drink it.

To eaſe and remove the Pains of the Gout.

Take two ounces of ſarſaparilla, cut it ſmall, and boil it in a quart of ſmall beer, till a third part be conſumed, drink it as hot as may be, and about a quarter of an hour after, bathe it with your warm hands a mixture equally of the ſpirit of wine and the fineſt oil of turpentine, where the afflicting pain is, and it gives preſent eaſe, and in a ſhort time makes it ceaſe.

For pains of the Teeth.

Take henbane-ſeed, and hyſſop-ſeed, bruiſe them finely together, mix them that they may ſtick well, with a little oil of ſpikenard, if hollow ſtop the tooth with theſe, and a piece of lint dipped in the oil; if not tie up the quantity of a large pea in a fine thin rag, and lay it to the root of the tooth, and the pain will ſoon ceaſe.

To take away Corns.

Cut well and cloſe, take out as much of the core as you can, then take burnt allum, and the pith of an oyſter that ſticks to the ſhell, dried and powdered; incorporate theſe with a little Venice turpentine; put into the hollowneſs, if there be any, a little tent of lint dipped in the oil of cloves, and lay on the other as a plaiſter, and it, in a week's time, with thrice renewing, takes away the corn, making fleſh ariſe to fill the hollowneſs.

For Blaſts, Burns or Scalds.

Take ointment of tobacco a quarter of an ounce, pigeons or pullets dung half an ounce, ſallad oil two ſpoonfuls, ſnow water the like quantity, cream a quarter of a pint, and the white of a new laid egg, beat and bruiſe theſe till they become a pliable ointment over a gentle fire, ſpread them on a fair cloth, and lay it to the afflicted part, and in three or four times renewing it will take out the fire and put the party in an eaſy way of recovery.

For the Stone or Gravel in the Reins or Bladder.

Take green parſly, if it can be got; that is running to ſeed; if not, other parſly, ſtamp it, and ſqueeze out an ounce of the juice, and as much of that of a very hard onion; take a little handful of ſloes, bruiſe them that the ſtones may break, mix theſe with a pint of white wine, and boil it well, then add to the ſtrained liquor a quarter of an ounce of calcined crabs eyes or claws, and let the patient drink faſting half of it, and move up and down ſwiftly, and within a quarter of an hour the reſt; and it will ſpeedily afford eaſe, and bring away ſand and gravel, if it remain in the ureters, or neck of the bladder or yard.

For a Conſumption.

Take a pint of the ſtrippings of a red cow warm from her, and beat the yolk of an egg in it; and then ſweeten it with ſugar of roſes, a ſpoonful of red roſe water, and a little nutmeg ſcraped in. Drink it in the morning for a month; this cured one given over by the doctors.

For the Cramp.

Dry eel-ſkins, and wrap about your legs and thighs.

Cough or Cold.

Take a quart of ale, and put a handful of red ſage into it, boil it to a pint, and put a quarter of a pound of treacle into it. Drink it warm going to bed.

Bruiſes inward.

Drink poſſet drink wherein comfry root is boiled, or heat ſack with ſaffron and treacle over the fire, and ſweat in bed; and ſome time eat honey mixed with nutmeg and butter. Spruce beer is alſo very good for an inward bruiſe. Read more of theſe things in the *Way to get Wealth*, by making 23 ſorts of wine; alſo to make china varniſh, and black ground for japan work, to ſlack wood and gild, with divers other curious matters.

For the Jaundice.

Broth made of ſtrawberry leaves and roots, eaten ſome days together, cureth it. A Monk got great riches by it. Read more of theſe in a book called *A Thouſand Notable Things*, wherein are many choice receipts in phyſick, and to make all ſorts of inks, dye bones, ivory, &c. make ſealing wax, to make fine pictures and ſaſhes for windows,

windows; with receipts for perfuming, gilding, dying, colouring, and on moſt ſubjects whatever.

Aches and Pains.

Ale ſodd till as thick as a ſalve, applied thereto, marvellouſly cureth it; often proved.

Chopt Lips.

Rub chaps or rough lips with oil of almonds, and it will make them fine, ſmooth, and well coloured. Read a book called *The way to ſave Wealth,* by living well for two pence a day, and to ſave ſoap, ſhoes, candles; to write ſecretly, keep cloths from moths, dye reds, take ſpots out of linen and woollen, make verdigreaſe, ſympathetick ink, white lead, ſoap, and many other curious matters.

Thus Reader, have I made good my promiſe in this crouded work, full of variety, and muſt now proceed to the Second Part.

THE
SECOND PART.

CHAP. I.

To make Glaſs of Cryſtal of all the ſeveral Colours, viz. Green, Gold, Yellow, Black, Garnet, Saphire, Ruby, Amethiſt, Cryſtal, Pearl, Turquois, and many other Oriental Colours.

The Foundation of the Work for Glaſs making.

THE firſt thing, to be conſidered in this, is the pulverine or Rochetta, which is the aſhes of a certain herb growing in the Levant and Syria, making a whiter ſalt than barilla of Spain, and more excellent for fair and beautiful cryſtal.

To extract this ſalt, powder the aſhes and ſift them very fine; to know how theſe aſhes prove, touch them with your tongue, to try the ſaltneſs or make an eſſay in a melting pot, to know if they bear much ſand (or tarſo) a thing uſeful in this art. Having tried your aſhes, ſet up coppers with their furnaces in imitation of thoſe uſed in dying, greater or leſſer as the quantity of ſalt intended requires, fill them with fair water; let your fuel be dry wood, and when the water boils put in the pulverine, a quantity in proportion to your water, and boil it with a continued fire till a third part of the water be conſumed, mixing them well at bottom with a ſcummer, that the pulverine may well incorporate with the water, and all its ſalt be extracted; then put in other fair water, and boil it till half be conſumed, and ſo there will be a lee impregnated with the ſalt. To encreaſe the quantity of ſalt and have it whiter, boil in the water, before you put in the pulverine, 12 pounds of copper of tartar of red wine, calcined to a black colour only.

When two-thirds of the water are conſumed in boiling, ſlacken the fire, ſeaſon earthen pans with fair water ſix days, then put the lees into them with large braſs ladles, as alſo the ice you find in the coppers, with the aſhes; having filled the pans, let them ſtand ten days, and in that time the aſhes will be at bottom, and the ice remain very clear, which muſt be taken gently off with braſs ladles, that the bottom riſe not; put it in other pans, and let it ſtand two days, that being purged from ſettlings, it may be more clear and limpid, which will be effectual when thrice ſettled; and ſo work till you have materials ſufficient.

To ſtrain the lees, and extract the ſalt, in the firſt place let the coppers be well waſhed with clear water, ſo fill them with the refined lees; let them boil gently, and put in the ice, till it thicken and ſhoot its ſalt, which uſually happens about the beginning of 24 hours, ſo that on the top ſalt will appear like white threads or ſpiders webs; then ſink a ſcummer full of holes to the bottom of the copper, and the ſalt will fall upon it, and now and then take it out, ſuffering the lees to run well off, but put the ſalt in tubs or earthen pans, that the ice may the better drain; ſave the liquor that drains from it to put in the copper, and dry the ſalt; continue doing ſo till all the ſalt be got out of the copper; when the ſalt is well dried, put it into wooden veſſels, which will ſuck up the moiſture. Thus from 300 weight of aſhes 80 or 90 pounds of ſalt may be got proper for this uſe; which being well dried, beat it, and put it into calcar (a ſort of calcining furnace) to dry with a gentle heat: Rake it over with an iron rake when it is dry, take it out, pound it well, and ſift it, that the biggeſt pieces exceed not grains of corn; when it is thus ordered, it muſt be kept clean from duſt or other annoyances, to make frit of cryſtal, which is made in the following manner.

To make Frit of Cryſtal, or Bollito.

To make this, if you would have your cryſtal fair, procure the fineſt tarſo (a kind of hard and white marble found in Tuſcany) beat it ſmall with an iron peſtle in a mortar, ſift it, and put 200wt. of it to about 130 of pulverine ſalt ſo ordered; mix them very well together, then put 'em into a calcar at firſt well heated for an hour, make a temperate fire, and rake the frit with an iron rake, that it may be well incorporated and calcin'd, then increaſe the fire, raking the frit for five hours, and raiſing the fire by degrees to a ſtrong one; when tis ſufficiently done, take out the frit, lay it on a floor, cover it with a cloth, and keeping all duſt from it, it will be as white as ſnow; keep it then in a dry place, ſo that the ſalt diſſolve not, for if it doth, and run from the tarſo, 'twill not vitrify; if it ſtand three or four months it will be the better to put in pots, ſoon be clear, and fit to prepare a curious cryſtal glaſs.

To make common Glaſs.

Frit of pulverine makes an excellent white and common fair glaſs. Frit of rochetta makes that between cryſtal and common glaſs; as much maganeſe well prepared muſt be uſed in common as cryſtal glaſs; and theſe, that you may have them the fairer muſt once at leaſt be put into water, and if you'd have them very fair, oftner, as you ſee convenient, ſo you may work them into what veſſels you pleaſe. To make them whiter, let 'em be well calcined, that there may be the fewer bliſters; and particularly obſerve, that if to each of them you put upon the frit the quantity of 12℔ of ſalt of tartar purified to 100 pounds of frit, the glaſs will be more pliable to work, and fairer than ordinary. Herein note, that you put in the ſalt of tartar when the frit is made, then mix the ſand or tarſo with the rochetta or pulverine well ſifted, and make them of a frit as before.

How to purify Salt of Tartar for this Work.

Take the lumps of tartar of red wine, calcine it in earthen pots till it becomes black, its oily quality conſumed, and it begins to turn white, but let it come to perfect whiteneſs, becauſe then its ſalt will be naught; put it then into earthen pans filled with fair water heated alſo in glazed earthen pots; make it boil over a gentle fire, till a fourth part of the water be evaporated; then take it off to cool, and when the water is become clear, decant it into other veſſels, ſo it will be a ſtrong ice; then put into the pans more common water upon the remainder of the tartar, and let them boil as before, till the water becomes more brackiſh. This done, filter theſe waters, and impregnate with ſalt; put the filtered ice into glaſs bodies, to evaporate in the aſhes of the ſurnace at a gentle heat, and in the bottom a white ſalt will remain, which diſſolve in warm water, and when 'tis two days ſettled, evaporate it at a gentle heat in glaſs bodies, and there will be a whiter ſalt remain at the bottom than the former; diſſolve this again, and filter and evaporate after two days ſettling as before. Do thus four times, and the ſalt will be as white as ſnow; which ſalt mixed with rochetta and pulverine, and a ſufficient quantity of tarſo, will make an excellent frit, that put in the pot, yields cryſtalline and common glaſs much fairer than what is made without this ſalt of tartar.

Having given you the ground work for white glaſs the beſt way, I come now to revive that excellent art.

Of colouring Glaſs, and firſt a curious Green.

To a pot of ten pounds of the metal of white glaſs put half of cryſtalline ſeveral times thro' water, and the other half common white metal of pulverine. Take four pounds of the common frit of pulverine, with this mix three pounds of red lead, unite them well together, and put them into a pot, and in a few hours they'll be purified, then caſt the metal into water, take out the lead, and return the metal into the pot, let it purify 24 hours, at which time if you put in the colour, made chymically with the powder of the Caput Mortuum, of the ſpirit of Vitriolum Veneris, adding a ſmall quantity of Crocus Martis, the colour will be perfected, and there ariſes a pleaſant green, reſembling the oriental emerald.

Another curious Green, fair and ſhining.

To do this, put cryſtalline into a pot that has not had maganeſe in it, and which has once or twice held water, to take out the ſaltneſs, and to it put half as much common or white metal made of pulverine, at ſeveral times, and when it is well mixed and purified, put to every 100 pounds, two pounds and a half of thrice calcined braſs made in the arches of the furnace, with braſs plates, and with this mix two ounces of calcin'd crocus martis, calcined with brimſtone and reverberated. Theſe powders being well mingled, put them to the metal, and if it has any blueneſs, add a little more crocus martis, and it will take it away; work it well with the metal according to art, and it will be a wonderful green of the burnet.

A fair Sea Green in a Cryſtal.

Put about 60 pounds of cryſtal frit in a pot well ſcumm'd, and not caſt into the water; and to the metal put a pound and half of the ſcales of braſs that come off by hammering the fire; when you have well calcin'd them, four ounces of well prepared zaffer. The powders being well mixed together before put into the cryſtal, put them in at four times, mixing the powders with the metal 2 hours, and then give it another mixture, as is uſual in this work, making proof of it till the colour has taken. With half cryſtal and half rochetta, a beautiful ſea green may be thus made.

A cheap Green.

Take the like quantity of zaffer and braſs prepared as before, put them in the ſame manner and form to rochetta of the Levant, as alſo that of Spain, neither of them having had any maganeſe, but been well ſcummed, and not paſſed thro' water, uſing the rules as before in the green cryſtal, by this means it will receive a very fair colour, and be afforded at a very cheap rate.

A Gold Yellow in Glaſs.

To do this, take rochetta frit one part, cryſtal frit two parts, being both made with tarſo, mix 'em together, to every hundred weight take of tartar in lumps, beaten and ſifted fine with maganeſe, each one pound; mix the powders by themſelves firſt, then with the frit, ſo put them into the furnace, letting them ſtand four hours at an ordinary fire, by reaſon they will riſe much; the metal being purified, and the colour well mixed with it, make it into what you think convenient for your uſe. In this caſe you muſt obſerve to put your colours in at ſeveral times, that the colour may take the better; you may heighten or leſſen the colour the more or leſs you put in; but if you'd have a fair good colour, let the frit be all cryſtal.

Glaſs, a Garnet Colour.

Take a ſmall quantity of rochetta and cryſtal frit, to every hundred add one pound of maganeſe, and an ounce of prepared zaffer; mix them well together before you put them to the frit; put them into the pot by degrees, and at the end of 24 hours, when it is well mixed, and of a pure colour, work it into form.

To make Glaſs of a Saphire Colour.

Put a pound of zaffer to each hundred weight of rochetta frit; let the zaffer be well prepared, and to every pound of it, add an ounce of maganeſe; mix the powders well together by themſelves, and then with the frit; put them ſo mixed into a furnace, there melt and purify them, and when pure and well coloured, work it, ſo the colour will be fine and durable.

To make Glaſs the Colour of Amethiſt.

Take cryſtal frit made of the fineſt tarſo, maganeſe well prepared a pound, zaffer done the like one ounce and a half; firſt mix the powders well together by themſelves, then with the frit, not with the metal in the pot. The proportion is a pound of frit to an ounce of powder. When it is pure coloured, work it as you pleaſe.

A Saphire Colour, very fair.

Inſtead of rochetta, take cryſtal frit, add the ſame quantity of powder as to the other ſaphire, and order it the ſame way, and you'll have a fair ſhining ſaphire coloured glaſs.

To make Glaſs of a very curious Black.

To do this, take the frit of cryſtal and pulverine twenty pounds each, calx of tin and lead four pounds; mix them well together, put them in a pot into a furnace well heated; the metal being pure, take ſteel well calcin'd, and powder'd ſcales of iron falling from a ſmith's anvil, each an equal quantity; powder and mix them, and put ſix ounces of this to the metal, letting them boil ſtoutly, often ſtirring it; let it ſettle 12 hours, and then work it, and it will be a fine velvet black, fit for all devices that require it.

To make Glaſs another fine Black.

Take of rochetta frit about two hundred pounds, to this put two pounds of tartar, and ſix of maganeſe, both powdered and well mixed, then put them leiſurely into the furnace; when they are melted and purified, which will be at the end of four days, mix and waſh the metal, and this makes a very curious black.

To make Glaſs a very deep Red.

Take 22 pounds of cryſtal frit, a pound of broken pieces of white glaſs, and two pounds of calcined tin; mix them together, and put them into a pot to run and purify, and when they are melted, take calcin'd ſteel, ſcales of iron falling from the anvil, of each a like quantity; grind them together, and when the metal is purified leiſurely, put an ounce of theſe to it, ſo mix 'em well, and let them incorporate, which they'll eaſily do in five or ſix hours; but beware you put not in too much powder, for that will make the metal black, and it ought to be tranſparent, and not opacous, of an obſcure yellow. When you find it ſo, forbear putting in any more powder, but put in three quarters of an ounce of braſs calcined to redneſs; let it be well ground, and in three or four times uſing, it will be a blood red, for which reaſon make frequent eſſays to try the goodneſs of the colour; take it in the nick, or it loſes its colour and turns black. That it may not do ſo, leave the mouth of the pot open. Let it not ſtand above ten hours in the furnace, ſuffering it to cool as little as poſſible. If you perceive the colour fade (as ſometimes it does) put in ſome ſcales of iron to enliven it. As this is one of the niceſt colours to be made, be careful in every thing, eſpecially in adding ſteel and ſcales, as alſo in working it.

To make a Milk White Glaſs, called Lattimo.

To do this curiouſly, take cryſtal frit twelve pounds, calcined tin and lead two pounds, mix them together, and take maganeſe prepared half an ounce; let them ſtand 12 hours till well melted, and it becomes a fair white, very pleaſant to the eye.

Another.

To do this, take about 400 weight of cryſtal frit, 60 pounds of tin calcined, two pounds and a half of maganeſe prepared; powder them and mix them with the frit, then ſet them in a pot in the furnace; letting them refine 18 hours, and they will be purified: then caſt it into water, purify it again in the furnace, ſo make an eſſay; if it be too clear, add 15 pounds more of calcined tin; mix it well with the metal, and in 24 hours it will become exceeding white, ſo work it. You may make this in like manner with rochetta frit, but not ſo white.

To make Glaſs Peach Colour and White.

Work this as the fair milk-white or lattimo, only with a little maganeſe, and it will be of a peach bloom colour; but take the exact time to work it when in full colour, leſt it loſes it.

To make Marble-coloured Glaſs.

This is eaſily done, obſerving well the rule, which is, to put cryſtal frit in a pot, and when it is melted, before purified, work it, and it produces a fine marble colour.

To make Pearl Colour.

Melt and purify cryſtal, put to it at three or four times tartar calcined to whiteneſs, or ſo often as on trial you find a cryſtal has taken pearl colour. Work it off ſpeedily, leſt the colour fades.

Frit of Natural Cryſtal, &c.

To make this you muſt have natural cryſtal, calcine it in a crucible, extinguiſhing it eight times in fair water, covering it ſo cloſe that no aſhes or dirt get in; when the cryſtal is well calcined, dry and grind it to a powder; mix this powder with ſalt of pulverine made into a glaſs body, ſo make frit with them, obſerving the quantities, rules, and proportion of maganeſe, as in other frit; ſet it in the furnace, and often throw it into water to purify it. Work it as other cryſtal, and you'll make a curious matter of it.

To make Glaſs Blue, or Turquois.

Take that ſea ſalt called Black, or Groſs Salt, put it into the calcar or purnello till the moiſture be evaporated and it becomes white; beat it into a fine powder, put it into a pot of cryſtal metal dyed with the colour of ſea green, made as I have directed; put in the calcined ſalt by degrees, and mix it well with the metal, till the ſea green loſes its tranſparency, and takes opacity; for the ſalt once vitrified, makes the metal loſe its tranſparency, giving it a paleneſs by degrees increaſing to a ſky colour, or that of a a turquois ſtone: When it has taken this colour, it muſt be ſpeedily work'd, or the ſalt will be loſt by evaporation; and if the colour be loſt, you muſt begin your work again with freſh calcin'd ſalt. And now, before I go further in this art, known to but few, for the better underſtanding of the reader, I ſhall give a more particular account of things uſeful in many colours.

To prepare Zaffer.

Take this in groſs pieces, let it ſtand 12 hours in the furnace in earthen pans, then put it into an iron ladle to be heated red hot in the furnace, ſo taking it thence, ſprinkle it with ſharp vinegar; being cold, grind it on a fine porphiry ſtone, ſo waſh it in glaz'd earthen veſſels with water warmed, ſuffering the zaffer to ſettle at bottom, then decant gently off, and you'll take aſide the droſs, leaving the pure, and the tincture remains in the bottom. Being thus prepared and purified, 'twill tinge more excellent than at firſt, making a limpid and clear tincture, which when well dried, may be kept in cloſe veſſels for uſe.

To prepare Maganeſe for colouring Glaſs.

Take that of Piedmont, as being the beſt of all others, put it into iron ladles, and in all the reſt proceed as in the zaffer.

To make Ferretto of Spain *to colour Glaſs.*

To do this, calcine copper, that the metal being opened, may communicate its tincture to the glaſs, get thin plates of copper the bigneſs of a halfcrown, and have one or more goldſmiths melting pots; make a layer of brimſtone powdered in the bottom of one of theſe, then a layer of plates, and over them another layer of powder; in this order fill the pot, which is otherwiſe ſaid to make a SSS cover; lute it well, and dry the pot, then put it into an open wind furnace amidſt burning coals; give it a ſtrong fire for two hours, and when it is cold you will find the copper calcined. This copper beaten ſmall and ſearſed into fine powder muſt be kept for uſe.

To prepare Crocus Martis for colouring Glaſs.

This is no other than ſubtilizing and calcining of iron. To do it, take the filings of iron, or thoſe of ſteel, which are better, mix them with three parts of powder of ſulphur, put them into a melting pot, then into a furnace to calcine, and burn well off all the brimſtone, ſo let it ſtand four hours in burning coals, then take and powder it; ſearſe the powder very fine, and put it into a crucible covered and luted at top, ſo ſet in the leer of the furnace, near the occhio or cavalet 15 days, or ſomewhat more, and it will be of a reddiſh colour inclining ſomewhat to purple. Keep it in a cloſe veſſel, to be uſed in glaſs colours, in which it is uſed with admirable ſucceſs.

To calcine Braſs called Orpello, or Tremolante; making a curious Sea-green, or Sky-colour.

Take thin braſs, and cut it in ſmall pieces, put it into a crucible covered and luted at top, ſet it in a fierce fire, let it ſtand four days in a great but not melting fire, for if it melts your labour is loſt; in that time 'twill be very well calcin'd, ſo powder it in the moſt ſubtile manner, ſearſe it, and there will be a black powder, which ſpread on tiles and keep a leer on burning coals four days, near to the round hole; take away the aſhes that fall upon it, powder and ſearſe it again, and ſo keep it cloſe ſtopt for uſe. To know if it be well calcined, put it into glaſs, and if it ſwells, tis right, if not 'tis not well calcined, or elſe 'tis over burned, and then it will not colour well.

To calcine Braſs another way, to make a tranſparent Red.

Cut it ſmall as the former, and put it into a melting pot, with layings of powder and brimſtone, and metal, as in copper; firſt ſet it on kindled coals, then put it into a ſtrong fire in the furnace, to calcine for 24 hours; then powder and ſearſe it, put it covered into the furnace on tiles of earth, for 12 days, to reverberate; ſo powder, grind, and keep it for uſe; beſides a red, it contributes principally to the making a yellow and chalcedony.

A Red Colour from Braſs.

Put ſmall pieces of it in the arches of the furnace, and let them be there cloſe till they are well calcined, but in ſuch a fire as they muſt not melt; and when calcined, powder the braſs, and the powder will be red and excellent in many uſes for colouring glaſs. Braſs thrice calcined, is likewiſe

wiſe very excellent, and is ordered in the following manner.

Braſs thrice calcined, to make a curious Colour in Glaſs.

Put this on the leer, or into the furnello of the furnace, near the occhio, into pans baked, or earthen tiles; calcine it for four days, and you will have a black powder, ſticking together, beat it fine and ſearſe it; calcine it as before, but a day longer, and then it will not ſtick together, and be of a ruſſet colour; and ſo the third time, but obſerve it be not too much nor too little calcined, for then it will not colour well; and to know when it is well, put it to purified metal, it will make it boil and ſwell, and if it does not, it is too much or too little.

This makes a curious ſea green, and an emerald green. The Arabian colour called turquois, a curious ſky colour, with other varieties. *Art's Treaſure.*

CHAP. II.

To make Glaſs of Lead, of many beautiful Colours, reſembling thoſe of Oriental Precious Stones, as Emeralds, Topaz, and others; and the Materials uſeful in the Work.

The ground Work for making Glaſs of Lead.

THIS is a very curious Art, which but a few underſtand, eſpecially as to the colours; tho' it may be held the nobleſt and faireſt of all other glaſs, yet great caution muſt be uſed in making it; for being well made, it imitates the true oriental gems, which cannot ſo well be done in cryſtal or any other glaſs, yet you muſt uſe great diligence in melting it, leſt all ſorts of pots are broken in doing it, and ſo the metal run in the furnace; and the buſineſs chiefly conſiſts in rightly knowing how to calcine lead, and to re-calcine it a ſecond time; for the more it is calcin'd the leſs it returns to lead, and leſs endangers your pots.

Obſerve alſo to caſt the metal into water, and by that means ſeparate the metal from the glaſs, even the laſt grains of it, but it muſt be done by little and little, that the ſeparation may be made the better, for the leaſt lead remaining, breaks out the bottom of the pot, and lets the metal fall out; and farther obſerve, that the pots and lead muſt not have too much heat in the furnace, neither muſt the metal be wrought too hot; and the marble wherein it is wrought muſt be of the hardeſt ſtone, and be wetted, or elſe it will break and ſcale.

A curious Way to calcine Lead.

At firſt calcine it in a kiln as potters uſe in a great quantity, for in two days they uſually calcine three or four hundred weight. In calcining take particular care that the kiln be not too hot, but ſo that it may keep the lead in continual fuſion, otherwiſe it will not be calcined. When it is well melted you will obſerve at the top a yellowiſh matter; then prepare to draw forward the calcined part with an iron ſuitable for that purpoſe, ever ſpreading it in the internal extremity of the kiln's bottom, which ought to be of ſoft ſtone that will bear the fire, and the kiln muſt have a declinative towards the mouth. When it is calcined, it muſt be put and ſpread a ſecond time in the kiln, that in a convenient heat it may reverberate, keeping it ſtirring with the iron for ſeveral hours, till it comes to this ſecond calcination to a good yellow, and be calcined; then finely ſearſe it, and what paſſes not the ſearſe, recalcine it with new lead.

To make Glaſs of Lead.

Take fifteen pounds of calcined lead, cryſtal rochetta, or pulverine frit, according as you would make the colours, twelve pounds; mix them exceeding well, and put them into a pot; let them ſtand ten hours, and then caſt them into water, for in that time they'll be well melted: Separate the lead, and return the metal into the pot, which at the end of 12 hours will be fit to work.

How to work the Glaſs of Lead.

To work this into veſſels, it will be neceſſary before it is taken upon the iron, to be a little raiſed in the pot; ſo take it out and ſuffer it to cool a little, then work it on the marble, being clear at firſt; let the ſtone be wet with cold water, that the glaſs may not draw away with it the marble and ſcale it, which without wetting it will, and ſo to the damage of it, incorporate it into itſelf; therefore you muſt continually wet it whilſt the glaſs is wrought, otherwiſe, by the marble ſticking in it, the fairneſs and beauty will be taken from it; do thus as often as you take the metal out of the pot.

This ſort of glaſs is very tender, that if it be not cooled in the furnace, and taken a little at a time and held on the irons and the marble continually wetted, it is next to an impoſſibility to work it; which cauſe proceeds from the calcined lead, that renders it ſo very tender; yet when well wrought it is an excellent glaſs.

To make Glaſs of Lead, of an Emerald Colour.

Take twenty pounds of the frit of pulverine, ſixteen pounds of calcined lead, ſearſed both into two powders, firſt by themſelves; and when well mixed together, put them into a pot, not too hot, for eight or ten hours, and then they will be melted; ſo caſt them into the water, and ſeparate the lead and the unctuoſity, which calcined lead and pulverine give it; and there will enſue a bright ſhining colour, and in a few hours it will run, and become very clear, then put into it braſs thrice calcined ſix ounces, mixing with it a penny weight of crocus martis, made with vinegar, put in at ſix times. This mixture does always well, mixing the glaſs at leaſt every two or three minutes, let it ſettle an hour, then mix, and take an eſſay thereof, when the colour is apt; then incorporate eight hours, and work it into veſſels, or other devices.

Note, If you let it ſtand in a pot when it hath received its colour, till it hath conſumed all the dregs, and is perfectly refined, it will be ſo like the natural emerald, that the ſight can hardly diſtinguiſh one from another.

Another curious Green,

This is made in all reſpects as the foregoing green with this addition, viz. That there muſt here be ſix ounces of Caput Mortuum, of Vitriolum Veneris, inſtead of the braſs in the other.

This is the rareſt green that can be made any way whatſoever.

A Sky or Sea Green, in Glaſs of Lead.

Take ſixteen pounds of the frit of cryſtal, ten pounds of calcined lead, mix and ſearſe them well together; ſet them in the furnace twelve hours, and the ſtuff will be melted; then caſt both it and the pot into water, ſeparate the lead; then a ſecond time let them ſtand eight hours in the furnace, again caſt them into the water, ſeparate the lead, and again put them into the furnace, and in eight hours more the metal will be very clear; then take of zaffer well prepared, a quarter of an ounce, calcined braſs four ounces, mix them well, and put them in at four times, in four equal quantities, and at the end of two hours, mix well the glaſs, and take an eſſay of it; then let it ſtand ten hours, in which time the colour will be well incorporated, the glaſs very well perfected, and be fit to be wrought in any works.

A Topaz Colour in Glaſs of Lead.

Take fifteen pounds of cryſtal frit, twelve pounds of calcined lead, mix and ſearſe them well together; ſet them in the furnace, but not too hot; at the end of eight hours put them in water to ſeparate the lead from the pot and glaſs; repeat this twice, and add half glaſs, of a gold yellow colour; let them incorporate and purify, and it will be of the colour of an oriental topaz.

Garnet Colour or Glaſs of Lead.

Take twenty pounds of cryſtal frit, and ſixteen pounds of calcined lead, ſearſe and put them into a pot, add to them of maganeſe three ounces, of zaffer half an ounce, both well prepared, and let them ſtand ten hours, caſt them into water, and ſeparate the lead, then put them again into the furnace, and let them purify ten hours, ſo mix them, and make an eſſay, and when it is perfected, and the colour of a fair garnet, work the metal into what form you think moſt convenient.

To make a Yellow Gold Colour on Glaſs of Lead.

Take calcined lead, and cryſtal frit, each ſixteen pounds, mix and ſearſe them, then add thrice calcined braſs ſix ounces, crocus martis made with vinegar a penny weight; mix them well and put them into a furnace, and let them ſtand twelve hours, then caſt them into water, to ſeparate the lead, and put them again into the furnace, where let them ſtand other twelve hours, then the metal will be clear; ſo mix them and take an eſſay; and if it appear green, put in a little more crocus martis, which will take it away, and ſo it will become a fair yellow gold colour.

A Sapphire coloured Glaſs of Lead.

Take of cryſtal frit fifteen pounds, calcined lead twelve pounds, ſearſe and well mix them together, ſo add to them a penny weight of maganeſe, and two ounces of zaffer, both well prepared, and let them ſtand twelve hours in the furnace; caſt them into water, and ſeparate the lead. Do the like a ſecond time, and when the colour takes, it will be that of oriental ſapphire, very fair, with the mixture of a double violet colour.

To colour natural Cryſtal of a Viper Colour, without melting.

Take cryſtal that is of a good water, fine and clear, in ſeveral pieces of different bigneſs, yellow orpiment, and crude mercury in powder, of each two ounces, ſal-armoniack one ounce; let the three laſt, in fine powder, be well mixed together, and put them in a crucible that will well bear the fire, and upon them the cryſtal in pieces, ſo cover the crucible with another, mouth to mouth, and well luted, and when they are dry, ſet them on coals, which kindle by little and little, and being fired, ſuffer them to flame of themſelves, and then they will ſmoak much, therefore you muſt do it in a large chimney, to avoid the fumes which are hurtful, and when the fumes are evaporated, let the cryſtal ſtand till cold, by the going out of the fire of its own accord, ſo unlute the crucibles, and take out the cryſtal, and thoſe on the top will be tinged with a curious yellow, a red ruby and balaſs colour, with fair ſpots, and thoſe at the bottom into the wavy colour of a viper, and will endure a good poliſhing, and contain a curious luſtre.

A curious Lapis Lazuli Colour.

To do this, melt the moſt tender white cryſtal and lattimo in a pot, and when well melted put blue ſmalt, by little and little, and when the colour comes well, let it ſtand in the fire two hours, then make an eſſay of it, and when it is proof, let it ſtand twelve hours; mix and work it, and if the metal riſe, put in a piece of leaf gold, and it will allay it, and ſo you will have the natural colour of Lapis Lazuli.

To colour Natural Cryſtal like Rubies, Balaſs, Topaz, Cizaſole, Opal, &c.

To do this, take orpiment of a yellow orange tawny, well powdered cryſtalline, white arſenick, crude antimony, and ſal armoniack, of each two ounces, powder and mix them very well, and put them into a large crucible, and upon them pieces of cryſtal, of a fair water, without any ſpots; let the cryſtal be ſomewhat large, and fill the crucible, and lute on it another, mouth to mouth, making a hole at the bottom of the uppermoſt, as big as a ſtraw, that the air may get in to evaporate the fumes. When the lute is dry ſet them in the coals, ſo that all the lowermoſt and the one half of the uppermoſt may be buried in the coals; ſo kindle the fire by degrees, and do as in preparing the other cryſtal, to avoid the fumes, which will be long; therefore keep a conſtant fire, very ſtrong, and keep out all cold air, leſt the cryſtal being brittle, break, and ſo well cooled as the other, the colour will appear,

To make Glaſs of Lead as red as Blood.

To do this, put into a pot ſix pounds of glaſs of lead, ten pounds of cryſtal frit, and when purified caſt them into water; then return them into the pot, and when they are well refined, put in five or ſix ounces of copper calcined to a red powder, and let them boil up and refine; after that put in a little red tartar in powder, and let the metal boil up again, and well incorporate, and take an eſſay, and if the colour be not come up to a height, put it again to anneal, till it comes to its colour.

To recover the faded Colour of natural Turquois.

Put it into a glaſs, and pour on it the oil of ſweet almonds, keep it warm, on temperate aſhes, and in two days the natural colour will return very beautiful.

To make Vitriolum Veneris, uſed in colouring Glaſs; and in ſome places mentioned.

Set covered crucibles in an open wind furnace, with burning coals; let them ſtand two hours, then ſuffer the furnace to cool of itſelf, ſo take out the crucibles, and you will find the copper you have put in, calcined to a blackiſh or dark colour, or obſcure purple, which powdered and well ſearſed put into an earthen veſſel that will bear the fire, ſet that in an open wind furnace, on croſs iron bars, fill the pans with lighted coals, put in the calcined copper, add to each pound ſix ounces of brimſtone powdered, and when the brimſtone begins to flame, keep it continually ſtirring till the brimſtone is conſumed and the ſmoak ceaſe, then take it out hot; do this by renewing three times, and you'll have a curious powder fit for your purpoſe; for being infuſed in water, in a retort for many hours, and well luted, the curious ſettling being ſeparated, it is excellent to mix (when dry) with zaffer; and put to cryſtal frit, maketh a beautiful ſea green, and in many other caſes an azure or curious ſky-colour.

CHAP. III.

To make curious Enamels of divers Colours, after the beſt Manner, for Gold and Silver Works, and other Metals. To fix Sulphur, Extract Animæ Saturni, &c.

The Ground Work of Enamels.

TAKE thirty pounds of fine lead, thirty three pounds of fine tin, ſearſe them when they are well calcined in a kiln, boil this calx a little in clean water in earthen veſſels, and when you take it off decant the water by inclination, and in it will be the finer part of the calx; put freſh water on the remainder, boil and decant it as before, as long as the water carries off any calx, and then recalcine what remains groſs, and draw off the moſt ſubtile part of it, as before; after that evaporate the water that carried off the finer calx over a gentle fire, that the calx may not fly out with it, but remain in the bottom; then take cryſtal frit made with tarſo finely ground, and of this calx, of each fifty pounds, white ſalt of tartar eight ounces, powder, ſearſe and well mix them; put the compoſition into a new earthen pot; giving it a fire for ten hours, then powder it, keeping it cloſe covered in a dry place. Of theſe materials all the ground of enamels are made, of what colour ſoever.

Materials or Utenſils for this Work.

In this curious work, which is in high eſteem and very profitable, it will not be amiſs to ſet down the materials or utenſils to be uſed; and therefore, 1ſt, Let the pot wherein you make the enamels, be well glazed with white glaſs, and that it bear the fire well. 2dly, Incorporate, and mix well the ſtuff and colour of the enamels. 3dly, When it comes to be refined, and the colour proves good, and all well incorporated, take it off the fire with a pair of tongs for the workman's uſe.

The Way of making Enamel.

Powder, ſearſe, and grind well the colours; having mixt them together as occaſion requires, then with the ſtuff of the enamel, ſet them in pots in the furnace; being melted and incorporated, caſt them into water, and when dry ſet them again in the furnace to melt, which will be ſoon, ſo make an eſſay, and if the colour be too high, take out ſome of it, and add more of the ſtuff of the enamel; if too light, add more of the colour, till you bring it to a due proportion.

White Enamel.

Take ſix pounds of the ſtuff for enamel, 48 grains of maganeſe, caſt it thrice into water; being refined, melt it, and it will produce a white enamel.

Turquois coloured Enamel.

Take ſix pounds of the ſtuff of enamel, melt, refine, and caſt it into water; then again ſet it in the furnace, and when it is melted, and well refined, put in three ounces of calcined braſs, at thrice, 96 grains of prepared zaffer, and 48 of maganeſe likewiſe prepared; mix theſe well every time, and let them incorporate; make a proof with your eye as to the colour, and when you find it right, take it out and keep it for uſe.

A Green Enamel.

Take four pounds of the ſtuff for enamels, place it in the furnace, and in ten or twelve hours it will be melted and refined, ſo caſt it into water, and place it again in the furnace in its own pot, and being refined, put in two ounces of braſs thrice calcined, mixed with two ounces of ſcales of iron well ground, put theſe in at three times, mixing and incorporating them well every time, and ſo work it up to a pure colour, and take it from the fire, &c.

To make Violet Coloured Enamel.

Take ſix pounds of the fineſt enamel ſtuff, three ounces of maganeſe well prepared, 48 grains of thrice calcined braſs, mix the powders very well together, and then do the like with the enamel ſtuff; put them into the furnace, caſt them into water, and being dry, put them again into the furnace, and when the ſtuff is refined and well coloured, make it up for uſe.

To make a ſky Coloured Enamel.

Take four pounds of enamel ſtuff, braſs of ſky colour and ſea green each two ounces, prepared zaffer 48 grains, and mix them well; then in all things, elſe uſe them as the former.

To make Purpliſh Enamel.

Take ſix pounds of the ſtuff for enamels, two ounces of maganeſe prepared, of braſs thrice calcined, ſix ounces; mix them very well together, ſet them in the furnace, and in all things elſe uſe or order them as in the other.

To make Gold Colour, or Yellow Enamel.

To make this, take ſix pounds of enamel ſtuff, three ounces of tartar, 72 grains of maganeſe prepared, grind and mix the powders well together, and after that with the ſtuff of the enamel, melt and order them as other enamels, and it will be of a fair golden yellow, proper to enamel on gold; but it will not ſhew ſo well there, unleſs it be worked on with other enamels, that may make a pleaſing variety of colours.

A Black Enamel, to make it.

Take four pounds of the enamel ſtuff, maganeſe and zaffer prepared, each two ounces, mix them well together, and then incorporate them well with the ſtuff; put the pot with theſe materials into the furnace, let the pot be large, and when they are melted and refined, caſt them into the water; then put them into the furnace again, and they will quickly refine, and become of a curious velvet black.

Another curious Black Enamel.

Take four pounds of the enamel ſtuff, of tartar four ounces, well prepared maganeſe two ounces, mix and grind them well, and then mix them well with the enamel ſtuff, and in melting and refining, uſe them as other enamels.

A Red Enamel.

Take of enamel ſtuff four pounds, put to it two ounces of maganeſe prepared; mix them well, and ſet them in the furnace in a large pot, and being melted and refined, caſt it in water, melt, refine, &c. again.

To make an Azure Enamel.

Take four pounds of enamel ſtuff, prepared zaffer two ounces, mix with it at firſt, of thrice calcined braſs 48 grains, and when the powders are well mixed, mix them with the ſtuff, and ſo order them in melting and purifying as other enamels, the melting, &c. being all one in every caſe.

Another curious Green Enamel.

Take ſix pounds of ſtuff, mix with it three ounces of ferretto of Spain well ground, and 48 grains of crocus martis, and being well mixed, melt and purify them as the former enamels.

Another curious Green Enamel.

Take four pounds of enamel ſtuff, refine it well in a pot, in the furnace, then caſt it into water, and put it into the pot and furnace again, ſo refine it; then put in at three times, thrice calcined braſs two ounces, of crocus martis made with vinegar, 48 grains; then melt and refine them again, with incorporating the powders.

Another Black Enamel.

Take ſix pounds of enamel ſtuff, prepared zaffer, crocus martis made with vinegar, and of ferretto of Spain each two ounces, grind and mix the powders well together, and then incorporate them with the ſtuff, and order them in the fire and water, according to the uſual rule.

A fair Red to Enamel Gold.

Take cryſtal frit, made of ſalt of pulverine, ten pounds, white tarſo finely ground, eight pounds, make a ſubſtantial ſtuff with this frit and water, roll it into thin wafers, put them into an earthen pan, into a little furnace, made in the faſhion of calcar, that they may be calcined about ten hours with a good fire, and for defect thereof, put them in the furnace, near the occhio, three or four days till they be calcined; take prepared calcined lead, and tin, and of tartar wine calcined, each two pounds, mix theſe well together; put them in a well glazed pot, glazed with white glaſs, and when melted, and pretty well refined, caſt the metal into water; ſo melt and refine it again; then put in the red powder of calcined copper 12 ounces, and when the colour is well purified, add crocus martis made with aquafortis, put it in by degrees, and give it leave to ſettle ſix hours, make a proof to ſee if the colour is good, if not, heighten it with more crocus martis.

To fix Sulphur for this Work.

Boil the flower of brimſtone an hour in common oil, and being taken off the fire, caſt upon it ſtrong vinegar, and the ſulphur of a ſudden will ſink to the bottom, and the oil will be on the top of the vinegar, then empty the oil and vinegar; then put freſh oil on the ſulphur; repeat this thrice, and then you will have a fixed ſulphur proper for the work.

To extract Anima Saturni, uſeful in Enamel.

Put well ground litharge into an earthen glazed pan, pour diſtilled vinegar upon it, let it be four fingers above it, and let it ſtand till the vinegar is of a milky colour; then decant it off, and put freſh vinegar upon the litharge; do this till the vinegar becomes no more coloured, then let the coloured vinegar ſtand in glazed pans, that the milky ſubſtance of the litharge may ſink to the bottom; then decant off the clear vinegar, and the remaining milky ſubſtance is the Anima Saturni; and if in this caſe the white ſtuff precipitate not well, caſt upon it cold water, which uſually makes it fall to the bottom, and when it does not precipitate, evaporate the water and vinegar.

CHAP. IV.

The Art of making Calcedony like Jaſper, Agates, and other lucid Stones, with their Clouds, Shadows, Spots, Waverings, and many other curious Embelliſhments; and to prepare the Materials uſeful in the Work.

TO make curious waverings, and other mixtures of colours, that ſurpaſs the workings of nature in calcedony, &c. I ſhall lay down ſuch perfect rules, as have not hitherto been diſtinctly known, (except to very few) And,

1. Put two pounds of aquafortis into a glaſs body, not very large, but with a long neck, and four ounces of fine ſilver, in fine ſmall pieces very thin, ſet them in warm water or near the fire, and as ſoon as the aquafortis heats, it will work and diſſolve the ſilver; then take a pound of aquafortis,

quafortis, and in it diſſolve ſix ounces of ſal armoniack: Let it diſſolve at a gentle heat, then put into the glaſs the ounce of zaffer, and half an ounce of maganeſe, all well prepared; alſo half an ounce of ſerretto of Spain, and a quarter of an ounce of crocus martis; calcined with brimſtone, alſo thrice calcined copper, blue ſmalt, and red lead, each half an ounce, let them be finely powdered, and put one after another into the body, which ſtir ſo gently that the fortis may be incorporated with them, and for ten days keep the body cloſe ſtopped, every day ſhaking it divers times; and ſo being well opened, put it into a furnace on ſand, and make ſuch a temperate heat, that in 24 hours all the aquafortis may be evaporated, then in the bottom there will remain a ſion colour, which being reduced to fine powder, keep it in a ſtrong glaſs veſſel,

When you prepare to make a calcedony, put into a pot, broken cryſtal made into a clear metal, and white glaſs and cryſtalline which has been uſed, for with ſuch frit as has not been wrought, it cannot be made; for the colours ſtick not to it, but are conſumed by the frit. To every pot of twenty pounds of glaſs, you muſt put two, or two ounces and a half of this powder, and ſometimes three ounces; put it in at thrice, that it may the better mix and imbody; and in doing this, certain blue fumes ariſe, and when it mixes, let your glaſs ſtand about an hour, then put in another mixture, and let it ſtand 24 hours, ſo it will be well mixed.

This done, eſſay it, and it will have a yellowiſh azure colour; this proof, many times returned into the furnace, and taken when it begins to cool, will ſhew divers wavey and very fair colours. After this, take eight ounces of tartar, ſoot of the chimney well vitrified, crocus martis calcined with brimſtone half an ounce, put it on by degrees, mixed in fine powder, at ſix times; taking a little interval between each putting in, mixing it with the glaſs, ſo that it may be well incorporated, and when all the powder is in, let the metal boil and purify 24 hours: Make of it a glaſs body, which put in the furnace many times; then try if it be enough, and there be blue toys on the outſide, ſea-green, red, yellow, and all colours with toys, and that it is illuſtrated with waves, ſuch as calcedony, jaſpers, or oriental agates have; and that to the ſight, the body kept within, appears red as fire.

When this body is made and perfected, you may work it into veſſels, variegated and new made, for they do not riſe well; but he that works it muſt obſerve to pitch off well the glaſs, and aneal it ſufficiently, that it may make waves and toys of the faireſt colour; and afterwards you may work it at the wheel, for it takes poliſhing, and a very fine luſtre as jewels.

If it happens that the colour fades, and the glaſs becomes tranſparent, then leave off working, and put to new tartar calcined, ſoot and crocus martis; for thus, as before, it takes a body and opacouſneſs, and the colour by that means will appear; ſo let it purify many hours, that as it is uſual, the powder newly put in, may be incorporated, then work it.

Another curious Way to make Calcedony, &c.

Diſſolve three ounces of fine ſilver in a pound of aquafortis, cut ſmall and thin, in a glaſs body, and ſo ſet it aſide.

In the next place, put a pound of aquafortis in another glaſs, and diſſolve it in five ounces of well purified mercury, and cloſe the body well.

Put another pound of aquafortis into another little glaſs wherein are diſſolved two ounces of ſal armoniack, then put in crocus martis made with aquafortis, feretto of Spain, copper calcined into red powder, and braſs calcined with ſulphur, of each half an ounce, grind and well powder theſe materials by themſelves, and put them in one by one into the body by degrees with leiſure, becauſe they all of them ariſe much.

In another little glaſs body let there be a pound of aquafortis, diſſolve in it an ounce of ſal armoniack, vitriol purified, crude antimony powdered, azure, or blue ſmalt, of each half an ounce, red lead an ounce, grind them well, and ſet them by in a veſſel.

In another glaſs diſſolve in a pound of aquafortis two ounces of ſal armoniack, add an ounce of prepared zaffer, and a quarter of an ounce of prepared maganeſe; of cinnabar an ounce, and half an ounce of thrice calcined copper, put them warily in, well powdered, every one by itſelf, that you may avoid the fumes that will ariſe.

In another glaſs put two ounces of ſal armoniack to a pound of aquafortis, then add verdigreaſe, ceruſe, red lake, and ſcales of iron, each half an ounce, let all theſe bodies ſtand twelve days, ſhaking every one of them ſix times every day, ſo the fortis will penetrate and ſubtilize the metal and ingredients, the better to communicate the tincture of the colour to the glaſs.

When this work is thus far brought to paſs, take a great glaſs body well luted at the bottom, and empty in it all the materials of the other little bodies by degrees, that they may not make the glaſs crack or run out in this great body; to mix the waters, that the materials may be well incorporated, and ſet it in the aſhes at a very gentle heat, for too much heat waſtes the powders, ſo that the fortis being evaporated, there will remain a reddiſh powder at the bottom, which keep cloſe in a glaſs veſſel for uſe.

When you deſign to uſe it, put it into the metal of broken pieces of glaſs that have been uſed, doing now as in the former, giving the metal the ſame quantity of time, and uſe the diſtance; then add the body of burnt tartar, ſoot of the chimney vitrified, and crocus martis made with vinegar, ſuffer them then to ſettle 24 hours, and work it in all reſpects as the former, and it will produce wonders.

To make divers Things uſeful in this Work; and firſt, to purify Vitriol, to make ſtrong Aquafortis.

To do this take the beſt vitriol, and diſſolve it in common warm water, let it ſtand three days till it is impregnated with ſalt; filtre and evaporate it in glaſs bodies till two-thirds of the water is conſumed; put the remainder into earthen glazed veſſels, ſet them 12 hours in a cold place, and the vitriol will ſhoot into pointed pieces, appearing like natural cryſtal of a fair emerald colour. Let this vitriol be diſſolved again, do as before, and thrice repeat it; at each diſſolving there will remain at the bottom a yellowiſh ſubſtance, which is unprofitable ſulphur, and muſt be removed.

At the third time you will find the vitriol ſo putrified, that it will make a ſtrong aquafortis, particularly if the nitre be well refined.

A good

A good Way to burn Tartar.

Take tartar of red wine, in great pieces, full of ſpots, put it into new earthen pots, let it burn till it ſmoaks no more, in a pretty good fire, and being calcined, and in lumps of purpliſh colour, it is well calcined, and prepared for uſe.

Aqua Regis; how to make it for this Work.

To every pound of aquafortis, made as before, put into a glaſs body two ounces of ſal armoniack well powdered, ſet it in an earthen veſſel of warm water, often ſtirring the aquafortis, which having diſſolved, the ſal armoniack will be tinged with a yellow colour, then put in more ſal armoniack whilſt the fortis will diſſolve no more; then let it have a little ſettling, and when it is clear, decant it off very leiſurely, and the unprofitable droſs of the armoniack will remain in the bottom, and this Aqua Regis will be of force ſufficient to diſſolve gold and other metals, but it will not do the like by ſilver.

CHAP. V.

To prepare Materials, and make artificial Precious Stones in Imitation of the true ones; as Topaz, Emeralds, Chryſolites, Garnet, and other oriental Stones, of a very curious Luſtre, differing from the True ones only in hardneſs, as being of equal Beauty; and to colour Balls or Globes of Glaſs within ſide, &c.

The Ground of this Work, in preparing Natural Cryſtal.

TAKE the cleareſt cryſtal you can get, free from ſpots, in pieces, put the pieces in crucibles covered at the top, and ſet them in hot burning coals, and when thoroughly heated put them into a large pan of cold water, and being cold, dry and re-calcine it; throw it into water, and ſo do ſucceſſively 13 times, keeping all aſhes and filth out of the crucible, and being ſufficiently calcined, grind it to an impalpable powder, as fine as meal, on a porphiry ſtone with a muller of the ſame, grind about a ſpoonful at a time, and often ſearſe it, till no roughneſs remains to be felt in the powder, leſt it make the work dirty or imperfect; and this is the ground-work to mix with colours, for making artificial jewels of paſte, as will appear hereafter.

Materials uſeful in this Work.

Obſerve to lute well the pots wherein the cryſtal is calcined, and the paſtes are baked, with good dry lute, before you either calcine or bake; and be ſure to take pots that will well endure the fire, and in all reſpects keep a juſt proportion in the doſe of the ingredients.

Always obſerve, before you bake the ingredients, to mix them very well, and if it fail to be thoroughly baked at firſt, you muſt do it again in a potter's furnace; and break not the pot till it is ſufficiently done, for if you do, it will be full of bliſters and foul.

Obſerve always to leave a vacancy of a finger's thickneſs on the top of the pot, particularly where it is held to ſwell much; for that you muſt put it with care and leiſure to prevent the materials running into the fire; or if it ſtick to the cover, the colour will be foul. Having given you theſe rules or directions, I now proceed to teach the making ſeveral ſorts of artificial jewels.

To imitate Topaz.

Take two ounces of prepared cryſtal, ſeven ounces of the ordinary minium, mix and bake them according to art, for a marvellous oriental Topaz colour; with which you may make what works you pleaſe.

A fair Emerald imitated.

Take two ounces of prepared cryſtal, ſix ounces of ordinary minium, mix theſe extremely well together, adding eighty grains of fine verdigreaſe well ground; mix and bake them, to work a fair emerald.

To make a Deep Emerald Colour.

To do this, take two ounces of prepared cryſtal, ſix ounces and a half of common red lead, mix them, and add of verdigreaſe about three penny weight, and 13 grains of crocus martis made with vinegar: mix them exceeding well together, and work it fit for baking: And to ſee when this, or other coloured paſtes are baked enough, purified and tranſparent, take off only the cover made of lute, and if it be ſo to the bottom it is enough, if not you muſt preſently relute, and bake it again, not breaking the pot, for the reaſons before mentioned; and let the fire be continued with dry wood 24 hours, and ſo you will have a beautiful colour for ſmall works, and to be ſet in gold.

But obſerve this emerald paſte muſt have a more than ordinary baking, to conſume the imperfection the lead brings upon it; and tho' it is ſomewhat brittle, it is excellent, ſhining and tranſparent.

To imitate Oriental Chryſolites.

Take two ounces of cryſtal prepared, and eight of ordinary minium, and when they are well mixed put to them 12 grains of crocus martis made with vinegar; bake it more than ordinary, and it will come out very fair.

A Sky and Violet coloured Paſte.

Take prepared cryſtal two ounces, four ounces of ordinary minium, and add four grains of fine blue ſmalt, well mix them together, and when baked there will be a curious violet and fair ſky colour.

Sapphires, to imitate in Paſte.

Take ſix ounces of ordinary minium, and two of cryſtal prepared; when well mixed, add five grains of prepared zaffer, and the like of maganeſe, and mix and bake the paſte well, and it will produce a curious ſapphire colour.

To imitate Garnet in Paſte.

To do this, take ſix ounces of ordinary minium, two of prepared cryſtal, when theſe are well mixed put 16 grains of prepared maganeſe, and three grains of zaffer; mix the paſte well, and when it is baked it imitates a fair garnet.

How to make Paſte imitate Precious Stones.

To do this, take ceruſe or white lead, grind it as fine as fine wheat flour, put it in a large glaſs body, put to it as much good vinegar as will cover it four fingers upward, putting it in by degrees till the fury and noiſe of it is over, ſo ſet it on a hot furnace in ſand, that the eighth part of the vinegar may evaporate; take it away, let the body cool, ſo decant it leiſurely, the vinegar being ſufficiently coloured and impregnated with ſalt, put it aſide in a glaſs veſſel, and pour freſh vinegar on the remaining lead, let this vinegar be diſtilled, then decant it as before. Do this till the ſalt is taken from the lead, and that will appear when the vinegar will take no further colour, nor has any taſte of ſweetneſs, which generally happens after the ſixth time of decanting. The work being thus far proceeded in, filtre the coloured vinegars when mixed together, ſo evaporate and dry them in a glaſs body, and at the bottom you'll find the ſalt of the ceruſe of a white colour. Set this in a glaſs body in ſand, being well luted from the neck downward, but let the mouth be open, and the heat of the furnace contracted for 24 hours; then take out the ſalt; if it be yellow, and not red it muſt ſtand 24 hours longer in the heat, and when it is of the colour of cinnabar tis enough; then make ſuch a fire as may not melt it, for if it does, your labour is loſt. Pour diſtilled vinegar on this calcined lead, repeating as before till you have extracted all the ſalt from it, and then ſeparate the earthineſs in part, or in the whole; keep this coloured vinegar in glazed earthen pans ſix days, that ſo all the imperfection may ſink to the bottom; then put the vinegars into a glaſs body, and cover it, ſo after ſome time ſtanding a white ſalt will be at bottom; then ſtrain it, that the groſſer part may remain, and cover the vinegar in a glaſs body, and at bottom you'll have a white ſalt as ſweet as ſugar, which you muſt dry well, which being diſſolved in common fair water, let it ſtand in earthen glazed pans ſix days; then take away the ſediment, and filtre and evaporate as before, ſo there will remain a ſalt as white as ſnow.

Do this thrice in the ſame manner; and being thus prepared, 'tis known by the name of Saccharum Saturni, which put into a glaſs body in ſand, and ſet in a furnace at a temperate heat for ſeveral days; when calcined, it will appear redder by far than cinnabar, and as ſubtil as the fineſt powder, and ſo it is called the true Sulphur of Saturn, purified from all earthineſs.

When you would make paſte for ſapphires, emeralds, topaz, garnet, chryſolite, ſky, or any different colour, take the ſame method as before, except that inſtead of ordinary red lead (where that occurs to any of them) you muſt take ſulphur of ſaturn, and ſo you may imitate jewels of exquiſite beauty, which far ſurpaſs any yet mentioned, where ordinary lead is an ingredient.

How to colour Balls of Glaſs, or other white Glaſs within, of curious Colours.

Take any orbicular glaſs that has a cavity, and ſeaſon it with warm water, then infuſe iſinglaſs two days in fair water, put the infuſion into a white pan, boil it till it be well mixed, then take it off, and while it is warm put it into a glaſs ball, &c. turn the glaſs about, that ſo it may wet and faſten every where within the glaſs, ſo let the moiſture drain; then with a hollow tube or pipe blow powdered red lead into it in all parts, that it may run on the moiſture, ſo wave it up and down, after that blue ſmalt, then powder of verdigreaſe very fine, with lake well ground, ſo that they may wave and intermix to make a curious colour; when they ſtick well take geſſo powdered, put a good quantity of it into the ball, and ſo turn it about; then put out the ſuperfluity, and the inſide being dry, many curious colours will appear.

CHAP. VI.

To extract Lake, and other curious Colours, from Flowers, Herbs, Seeds, and other Things, for Painting, Limning, *&c.*

To extract Lake from red Roſes, wild Poppies, red Violets, Flower de luce, Orange, Borage, Carnation, or other Flowers.

TO do this, take what quantity you pleaſe of the leaves of the flowers, which being bruiſed on a leaf of white paper, tinges it with its colour: You may aſſure yourſelf of ſucceſs, but thoſe herbs or flowers that do not ſo, are not ſerviceable in this way.

This experiment being made, put ordinary aqua vitæ into a glaſs body, the head as large as may be; and in the top put the leaves of ſuch herbs, and flowers from which you would draw a tincture; then lute the joints of the head, and fit a receiver to it, ſo give it a temperate heat, that the more ſubtil part of the aqua vitæ aſcending to the head, and falling on the flowers, may ſuck out the tincture, ſuffering it to do ſo, ſo long as it comes coloured; after that, diſtil the coloured aqua vitæ in a glaſs veſſel, which will be over-white at its coming forth, and is fit for uſe in this nature at other times; and then the tincture remaining at the bottom muſt not be over-dried, but care taken that it may be moderately done; and ſo you may have the tincture of curious lake from all flowers and herbs fit for limning, and other beautiful works.

To yellow Lake, extracted from brown Buds, or other yellow Flowers that have a good Tincture, another Way.

Make a lee of lime and barilla tolerably ſtrong, and in it over a gentle fire boil freſh broom flowers, having their full ſap or ſubſtance in them. Order it ſo, that the lee may draw to it all the tincture of the flowers, which will be known by their turning white, the lee being then as yellow as Theban wine; after that take out the flowers, and put the lee into glazed earthen diſhes, ſet it at a moderate heat; after that let it boil by degrees, and put to it ſo much roach allum as may well diſſolve with the fire. When it is well order'd put the ley into veſſels of fair water, and the yellowneſs will ſettle at the bottom; ſo when the ſettlement is made, decant off the water, and pour on that which is freſh, and when the tincture is ſunk, order it as the former. Do this till the ſalt of the ley is quite taken out, as alſo the taſte of the allum, and then the tincture of the colour will be the fairer, and ſo till the water runs out ſweet, without any ſaltneſs, with the ſame taſte as when it was put in; and then at the bottom you will find a curious and beautiful lake for uſe, and whilſt it is wet ſpread it upon a piece of white cloth, and dry it in the ſhade upon new baked bricks, and keep it dry, and as much from the air as may be; and theſe two ways at your diſcretion, you may extract colours from any flowers or herbs that have natural tinctures.

To make a curious Blue, or Sky.

Take three parts of the flour of brimſtone, two of quickſilver, and eight parts of ſal armoniack; grind theſe well on a porphiry ſtone, and with the quickſilver put them into a long necked glaſs, well luted at the bottom; ſet it in ſand, and make a gentle fire till the moiſture riſes, then let the glaſs be ſtopped at the mouth, and encreaſe the fire as in ſublimation, till the end; and a very illuſtrious fair blue will be the reſult of your labour.

To make that Embelliſhment called the Mixture of the Spheres.

Take purified tin that is well purged, three pounds, copper well purified one pound; melt firſt the copper, then the tin, and being well melted, caſt upon them ſix ounces of tartar of red wine, only burnt, and of ſalt petre an ounce and a half, and two ounces of arſenick, and a quarter of an ounce of allum finely powdered; ſuffer them to evaporate, and then caſt them into the form of a ſphere, which metal may be curiouſly burniſhed and poliſhed, and will ſhew rare in the mixture for ſpheres.

A Lake to be drawn from Cochineal.

Infuſe in cold water a pound of the ſhearings of the fineſt woollen cloth a day, and ſo preſs it well to take away the oilineſs of the wooll; then in this manner allum the ſhearings, viz.

Take of roach allum four ounces, and two of crude tartar finely powdered, one of cochineal; put theſe into a little pipkin, with about four quarts of water, and when this begins to boil put in the flocks; let them boil over a gentle fire half an hour, ſo take them off, and ſuffer them to cool ſix hours, then take them out, and waſh them well in fair water; and when the water is well ſoaked in them by ſtanding two hours, preſs it out, and let the flocks dry. Evaporate the water, and at the bottom you'll find a ſediment of a curious tincture, as alſo in the flocks.

Lake of Brazil and Madder.

In this caſe you muſt work each of them by themſelves, but uſe not ſo much allum by an ounce as you did before, becauſe the tincture of the cochineal is deeper than that of brazil and madder; wherefore give them their due proportion, which you will ſoon find by practice; and to one pound of flocks uſe more brazil or madder for weight. They have not ſo deep a tincture as cochineal has. Work in all points as in the former, and you will have a very fair lake,

Lake of Cochineal, another more eaſy Way.

Put a pound of roach allum powdered, into a pottle of aqua vitæ of the firſt running, and being well diſſolved, put in an ounce of cochineal in powder finely ſifted: Do as in the former, and put the materials in a glaſs body with a long neck, ſhake it often, that the aqua vitæ may be well tinctured, then let it ſtand four days, and ſo pour it into a clean glazed earthen pan; in common water diſſolve four ounces of roach allum, put that to the coloured aqua vitæ in Hippocrates's ſleeve, or a woollen bag, and for the reſt order it as the other cochineal lake, and it will anſwer.

CHAP. VII.

The curious Art of painting Glaſs in various Figures and Colours in Oil, and annealing the Colours in a Furnace, to make them endure all Weathers.

SEeing all have not the convenience to make glaſs of divers colours in a ſolid body, 'twill be proper in this work to give an inſight into the ſuperficial colouring, or painting it with colours that ſhew fair on the outſide, tho' they penetrate not. And in the firſt place I ſhall treat of the colours proper to be uſed in this Art, and ſo proceed to directions for uſing them.

For a fair Yellow.

Take a fine thin piece of good ſilver, dip it in melted brimſtone, when it has laid there a while take it out with plyers, light it in the fire, and hold it till it has done burning; then beat it to powder in a braſs mortar, and grind it with gum arabick and a little oaker.

A Gold-coloured Yellow.

Take a drachm of fine ſilver, antimony in powder two drachms, put them in a crucible in a very hot fire about half an hour, then caſt it into a braſs mortar, beat it to powder, and put to it ſix drachms of yellow oaker, old earth of ruſty iron 7 drachms; grind 'em very fine for uſe.

To make a curious blue colour.

For this purpoſe take the cleareſt leads you can get, beat them in a mortar, get enamel of the ſame colour very tranſparent, grind each by itſelf, then take two parts of lead and enamel, ſo grind them together as you did the ſilver.

A fine Carnation Colour.

Take four drachms of jet, tin, or litharge of ſilver two drachms, gum and ſcales of iron, each one drachm, and of red chalk one ounce; grind theſe fine, and mix them well together.

A Velvet Black.

Take the ſcales of iron and jet, each a like quantity, mix them well together for uſe.

Another curious Black.

To make this, take ſcales of copper and iron, each a drachm, heat them hot in a crucible, then take half a drachm of jet, grind them ſmall, and temper them with gum-water.

A curious White.

Make this of cryſtal, ground as fine as meal, and tho' it be of natural white glaſs colour, it ſerves curiouſly to diaper it up, and for other uſes.

A pleaſant Green.

Take dried verdigreaſe, and grind it well with turpentine, put it into a glazed earthen pot, and when you uſe it, warm it ſo that it may run and ſpread well, and ſo be pliable for the work.

A fair Red Colour.

Powder ſanguis draconis, and put to it rectified ſpirit of wine, and when it has been a while cloſe covered, it will grow very tender; wring it out into an earthen glazed pot; take the fine liquid part for uſe.

Another Carnation, very pleaſant.

Take jet three drachms, red oaker five ounces, tin-glaſs an ounce, gum two drachms; grind theſe well together, and you'll have a fair carnation.

The Manner and Way of Painting on Glaſs.

The manner of this is two fold, viz. In oil colours, and ſuch colours as are afterward to be annealed and burnt on.

To lay Oil Colours.

To lay oil colours on glaſs, you muſt firſt grind them with gum-water, then temper them with Spaniſh turpentine, ſo lay them on according to art, in figures or otherwiſe, and let them dry by the fire, and the work is finiſhed.

To anneal or burn Colours on Glaſs.

To do this, and make the colours abide well, you muſt have a four ſquare brick furnace, a foot and a half broad, and as much in depth, lay five or ſix iron bars on the top of it, and raiſe the furnace about eight inches above the bars; then lay over the bars a plate of iron, and ſift on it ſlacked lime, and upon the bed of lime lay a row of glaſſes, then cover them with lime, and lay on another row of glaſſes, and ſo on, till the furnace be filled.

Lay likewiſe with every bed of glaſs a waſte piece, that you may wipe over with any colour. Theſe are termed watches, and ſo when you think the glaſs is ſufficiently burned, with a pair of plyers take out the lowermoſt and uppermoſt piece or watch; lay it on a board, and when it is cold, uſe your endeavour to ſcrape off the colour; and if it hold well on thoſe rows from whence you took them, they are ſufficiently done, and will hold their colours againſt all weathers, and by this rule try all the reſt, and proſper in your work.

CHAP. VIII.

The curious Art of Gilding divers ſorts of Metals with Leaf and Water-Gold, laying on Silver, &c.

To lay Gold upon Metals, Wood, &c.

GRind red lead very fine, temper it with linſeed oil, ſtrike it gently and very thin over with a pencil; let the gold leaves be laid on very even, and when well dried, burniſh the piece, and it will caſt a curious luſtre; and in this manner ſilver is laid on.

To

To lay Gold on Glaſs.

Take red lead and red chalk, of each a like quantity, grind them well together, and temper them with linſeed oil, lay it on as the former, and when it is almoſt dry lay leaf gold on it exactly even, and being full dry, poliſh it.

To Gild on Stone or Wood.

To do this neatly, take oil of ben, and bole armoniack, of each a ſufficient quantity, beat and grind them well together, and finely ſmear the wood or ſtone with it, and being almoſt dry, lay on leaf gold as before, and being well dried, poliſh it, and it will ſtick and ſhine gloriouſly.

To Gild that the Water ſhall not injure it.

Take calcined oaker, pumice-ſtone, of each a like quantity; add a little tartar, and beat them with linſeed oil, then drop a few drops of fine varniſh, ſtrain theſe well mixed thro' a fine linen cloth, and ſo you may gild with it.

To gild Iron or Steel.

To do this, take an ounce of tartar, three ounces of vermilion, bole armoniack and aqua vitæ, each two ounces, grind theſe with linſeed oil, and put to them half an ounce of lapis calaminaris, finely powdered, grind again with a few drops of varniſh, and ſo take them off the ſtone; ſtrain it, that it may be the thickneſs of treacle, and ſo ſtrike it thin and gently over the metal, when warm, and when it is near dry, lay on your ſilver and gold, and burniſh it.

A Water to gild Knives, Steel, Swords, &c.

Powder fire-ſtone, and put it into ſtrong red wine vinegar; let it remain in it 24 hours, boil it in a gallon pot, putting in more vinegar as the other evaporates. Into this water dip the metal, and at firſt it will be black, but being dried and well poliſhed, under that blackneſs there will be a curious gold colour.

Another curious Way for Water-Gilding.

To do this, take of roach allum three pounds, roman vitriol three ounces, orpiment an ounce, verdigreaſe 24 grains, ſal gem three ounces, and when theſe begin to boil in the water, put in of tartar and bay ſalt, each half an ounce, let them boil a conſiderable while, and then take off the veſſel, and the iron being a little warm, ſtrike it over with this liquor, and when it is dried before a gentle fire, burniſh it, and you will have a curious luſtre.

To gild Silver or Braſs with Gold.

Take two ounces of quickſilver, put it into the fire in a crucible, and when it firſt ſmoaks, put into it an angel of fine gold; ſo immediately take it off, and the gold will be preſently diſſolved, and if it appear too thin, ſtrain part of the quickſilver thro' fuſtian, then rub the quickſilver and gold on braſs or ſilver, and it will ſtick to it; ſet the braſs or ſilver on quick coals, till it begins to ſmoak, ſcratch it with a bruſh, that the mercury may ſeparate and evaporate, and leave the gold of a faint yellow; then heighten it with bole, ſal armoniack and verdigreaſe, grind and temper it with water.

CHAP. IX.

A Treatiſe of Metals, in Tinging, Tincturing, and altering their Colours; hardening, ſoftening, refining, melting, making Quickſilver malleable, and many other curious Matters.

To make Braſs.

TO do this, take three pounds of copper, one of lapis calaminaris in powder, melt them together for the ſpace of an hour, and then put it out, and the copper will be tranſmuted into a fair ſhining braſs.

To make Braſs White.

Dilute in aquafortis about a penny weight of ſilver, put it in a veſſel to the fire, till the ſilver turns to water; to which add as much powder of white tartar as will ſuck up the water; then make it into balls, rub any poliſhed braſs with this, and it will take the colour of ſilver.

To make Copper of a Gold Colour.

Melt the copper, and put a little zink to it in filings, and being incorporated, it will be of a very ſhining gold colour.

To make Copper exceeding white.

To make this metal of a ſilver colour, take ſublimate, ſal armoniack, of each a like quantity, boil them in vinegar, in which quench the copper when taken red hot out of the furnace, and it will bear a luſtre like ſilver.

To make Gold or Silver ſoft.

Take ſal armoniack, mercury ſublimate, of each a like quantity, melt the gold or ſilver, and put to it a little of this powder, and the metal will be ſoft.

To make Quickſilver malleable.

When you have hardened your quickſilver, break the metal in ſmall pieces, and boil it in ſharp vinegar a quarter of an hour; put to it then a little ſal armoniack, and digeſt it 10 or 12 days, ſo put all together in a luted crucible, and ſet it in the fire, till by degrees it becomes red hot, and cracks little and little, then hang the mercury in a pot, with brimſtone at the bottom; lute it well up, ſo ſet it in the fire, that it may grow hot by degrees, and receive the fume of the ſulphur. Do this for a month once a day and the mercury will run, and endure the hammer on any occaſion. Now to harden quickſilver for this work, put lead ſeparate from its droſs into a veſſel, and when it cools thruſt in a pointed ſtick, which ſoon take out again, ſo caſt in the quickſilver, and it will congeal; then heat it in a mortar often, and it being hard melt it, and put it into fair water, after which uſe it.

To tinge Silver of a Gold Colour.

To do this, take fine gold and ſilver, good braſs and copper, calcined with live ſulphur, of each a like quantity, and it will appear to be gold of 18 carats fine.

To tinge Iron of a Braſs Colour.

To do this, melt iron in a crucible, caſting on it ſulphur vivæ; then caſt it into ſmall rods and beat it into pieces; for by this means it will be very brittle, ſo put in aquafortis, diſſolve it, and evaporate the menſtruum, then with a ſtrong fire reduce the powder into a body again, and it will be of a good braſs colour, ſcarcely diſcernable from that made of copper.

To make Iron a Gold Colour.

Take the powder of allum, of melancy, and ſea water, mix them till the powder is well diſſolved, then heat a bar of iron red hot, and often quench it in this, and it will produce a gold tincture.

To make Iron a Silver Colour.

Take ſal armoniack in powder, and mix it with unſlacked lime; put them in cold water, let them diſſolve there, then heat the iron, and being, when red hot, quenched therein, it will be as white as ſilver.

To ſoften Steel, the better to Engrave on, &c.

Do this with a Lixivium of oak, aſh, and unſlacked lime, by caſting the ſteel into it, where it muſt remain about 14 days. Now to harden it again when the work you deſign is done upon it, quench it ſix or ſeven times in the blood of a hog, mixed with gooſe greaſe; at each time before you dip it again, dry it at the fire, and it will be very hard, but not brittle.

To tinge Lead of a Gold Colour.

Take lead that is well purged from the droſs, one pound, an ounce of well powdered ſal armoniack, half an ounce of ſalt petre, and 2 drachms of ſal elbrot, put them into a crucible two days, in a gentle fire, and the lead will be thoroughly tinged.

To make Tin that it will not crack.

Take honey and ſalt, of each a like quantity; when they are mixed, melt your tin, and throw it when melted about 12 times into it, and ſo it will purge and leave off cracking.

If the tin thus uſed be put into a luted crucible, and calcined 24 hours, it will prove like calx of gold.

A Powder to make all Metal Soft.

Take a quarter of a pound of antimony, axinaginum, vitel, and ſalt, each a like quantity; make theſe into a powder, melt this powder with the metal, and it will effect your deſire.

To make Metal melt with ſpeed.

Put your metal into a crucible, with layings of brimſtone, ſalt petre, and ſaw duſt, and theſe taking fire in a good heat, will ſoon cauſe the metal to run, and ſave you much labour.

To put a good Temper on any edge Tools.

When you have made your edge tools of hard metal, heat them red hot in the fire, and dip them in cold water wherein ſoap has been diſſolved; after that hold them on hot coals till the edges begin to grow yellowiſh, then drop tallow on them, and dip them in cold water, and the temper will be fitted very excellent for uſe.

To ſolder upon Silver, Braſs or Iron.

For ſoft ſolder that runs ſooneſt, take braſs four penny weight, ſilver five penny weight, melt and mix them well together.

To ſeparate Silver from other Metal.

Melt a piece in a crucible, and caſt in ſome ſulphur, and when the ſulphur is conſumed, it will carry away in its fumes the greater part of the droſs, and that which continues will eaſily be ſeparated from the ſilver, which will remain entire.

To gild Iron, &c. a curious Tinge.

Take three pints of ſpring water, two ounces of roach allum, an ounce of roman vitriol, two ounces of verdigreaſe, four ounces of ſal gem, two ounces of orpiment; let them boil well, and then add ſome ſalt petre and tartar; let theſe boil up again, then take them off, and the metal being very warm, rub it well with this liquor, and it will ſet a curious burniſh on it.

To diſſolve Gold upon one's Hand.

To do this, diſtil the blood of a deer newly killed in balneo mariæ, ſoak the gold upon the lees three times, and the third time it will diſſolve into little particles.

To make Copper very ſoft.

Melt burnt braſs with ſtorax in a crucible, quench it with linſeed oil, ſo beat it on an anvil moderately, and boil it again, quench it as before, and do ſo five or ſix times, and when it is ſufficiently ſoftened, run it with copper, and it will make it as pliable as lead.

To make Iron or ſilver a Braſs Colour.

Take flowers of braſs, vitriol, and ſal armoniack of each a like quantity, beat them into fine powder, and let them ſeethe about half an hour in ſtrong vinegar, then take off the veſſel, putting in iron or ſilver, and covering it, and when it is cold take out the metal, and it will appear like fine braſs, and be fit to be gilded.

To colour and ſoften Gold.

Diſſolve verdigreaſe in vinegar, and ſtrain it through a frit, then congeal, and when it begins to grow thick, put to it ſal armoniack, and let it harden a conſiderable time, ſo melt the gold with it and it will not only heighten the colour, but render it ſoft and very pliable.

CHAP. X.

A Miſcellany or Mixture of Curioſities; being rare Secrets, known but to few, and highly profitable and pleaſant.

To whiten Natural Pearl.

TO do this, take half an ounce of bean-flour, lime and eggs beaten together an ounce, water of conſound, alcohol of wine, diſtil them, and put the diſcoloured pearl into the diſtilled water, and they'll be a curious ſilver white.

To make Horn like Tortoiſe-ſhell.

Take a drachm of the litharge of gold, half an ounce of quicklime, mingle theſe well together, make them into a paſte with white-wine, and of this make layings on horn that's thin on the ſides. Being clear and dry, take it off after five or ſix hours: add tripoli and a little ſallad oil to it, and when that has lain as long, rub it off with a linen cloth, ſo poliſh it, and the places where this has lain will be diſcoloured like tortoiſe.

To make a Walnut Grain on white Wood.

Thinly ſpread on it 7 or 8 lays of ſtrong glue, one after another, each being firſt dried, and it will become ſhining; then wet a bruſh or pencil in common water, and form your knots or other ſtrokes in the glue whilſt warm, ſo ſtrike hard on it with a wooden bruſh, and lay another laying of glue, and poliſh it.

To cement broken Glaſs, a curious Way.

Take glair of eggs mixed with quick-lime, burnt flint (i. e. flint calcined to powder) and egg-ſhells; with theſe and gum-ſandarack make a glue or cement, and anoint the broken edges of the glaſs with it warm, as thin as may be; place the other pieces right and even on it, and let it cool, ſo let it lie in water an hour; take off the ſuperfluous glue, and the glaſs will be as firm as ever, and the cracks not be diſcerned, but with great difficulty, by a very clear light.

To make Saſhes for Windows as clear as Glaſs.

Take vellum, thin parchment, or the fineſt white paper, as ſmooth on both ſides as may be, and being wet and ſtretched, put it on the ſaſhes as ſtreight as you can without tearing, then let it dry gently in the ſhade; take two parts of nut oil, or linſeed oil, two parts of fair water, and a little white glaſs beaten to fine powder; boil them in a glaſs body in ſand ſet on a tile pretty near the fire, till the water be conſumed; then mix and ſtrain it, and lay it on very thin with a fine bruſh, but ſo that it may ſoak thro' the paper; and they will be exceeding tranſparent.

To ſoften or diſſolve Horn or Tortoiſe-ſhell.

Make a ley of the aſhes of burnt bean-pods, ſtrong vinegar, quicklime and tartar; put in the horn in thin pieces, and in 4 or 5 hours the horn will turn to a jelly, or be ſo ſoft that you may work it into what form you pleaſe with little labour. The like may be done with tortoiſe-ſhell, but it will not jelly; however, it will be ſo ſoft that it may in a manner be moulded like wax, and very pliable to make ſmall boxes or watch-caſes, and other things.

To ſoften Ivory, a curious Way.

Boil a good handful of ſage leaves in thrice diſtilled vinegar, put in a little quicklime, and boil the ivory in it, and it will grow ſoft and tough, and not break but with great difficulty, when it is worked in the fineſt comb teeth, or other fine works.

To take Spots out of Ivory, and whiten it a new Way.

To do this, lay the ivory in quicklime, and pour firſt a ſprinkling of vinegar, and then water, but not too much, that the heat may not be too great, to make it ſcale or grow brittle; and when it has lain 24 hours, take it out, waſh it with white wine, rub and poliſh it, and it will be marvellous white.—Read Art's Treaſure.

To melt Amber for divers Uſes.

Take amber that is not brittle, put in pieces in juice of citron, or ſtrong vinegar ſo that it may ſwim about an inch or two in the veſſel you put it into; and ſo ſet it over a gentle fire, and let it heat and ſimmer till it boil up; then ſee when the amber grows ſoft or diſſolves, and put it to the uſe deſigned.

To make artificial Ambergreaſe.

Take florence orris roots and white ſtarch, of each an ounce, aſphaltum, or bitumen, half an ounce, ſperma ceti an ounce, ben nuts an ounce, muſk a drachm, gum Tragacanth as much as will bind it cloſe together, when well incorporated to make up.

To work theſe, obſerve that in the firſt place you make a paſte of the benjamin, ſtarch, and ſperma ceti; this done, take one part and make up half the aſphaltum; the other part make into a black paſte, with all the ingredients; then join and temper them well with your hand.

To make Light for Lamps that will not ſmoak.

To do this, diſtil a quart of good olive oil, and make the wick of talk, or ſtone allum, like other wicks; which is to be done by ſteeping them well in water, and they will ſpin out; and to make the oil riſe, make a great many little holes with a fine awl or needle in the wick, and it will give a bright and curious ſteady light without ſmoaking.

To make a Candle not to be put out by any Wind.

To do this, fill a ſmall pliable reed, or wheat ſtraw with natural live ſulphur, wrap it about with fine lint or cotton, cover it about with wax, and make it in the form of a candle; and then if the wind happens to blow it out, the ſnuff touching the ſulphur, will immediately light again, to great admiration.

To hinder any oil that is to burn, from ſmoaking.

To bring this about, diſtil the juice of onions, and put a little of it at the bottom of the lamp, or whatever you burn it in; and the oil ſwimming on the top, the ſtrength of the diſtilled liquor underneath penetrating, it will hinder it from ſmoaking, and make it burn the brighter.

To put a curious White on Alabaſter, and white Marble.

To do this, beat pumice ſtone into fine powder, and for 12 hours or thereabouts, infuſe it in verjuice; then dip a ſponge in it, and rub the ſtone well with it pretty warm, then waſh it with a woollen cloth dipped in fair water, and ſo dry it with another woollen cloth, and poliſh it, and it will be an admirable ſhining white.

To make ſhining Japan, or China Ink.

Take an ounce of lamp black, 2 drachms of indigo, half a drachm of peach black, one drachm of black endive burnt; beat them into a fine powder, and then with a moiety of fig-leaf water, and another part of milk, and a very little gum arabick, and when they are well mixed, make them up for uſe; but before you uſe the lamp black in this work, clarify it in an earthen pipkin, to take out the droſs.

To make yellow Amber White.

This is a rare ſecret, and profitable to be put into practice. To do it, take a pound of yellow amber, and put it into a very ſtrong cucurbit of earth; add to it two pounds of ſal gem, or bay ſalt, pour upon them the like quantity of clear ſpring water, or as much as will ſerve to diſſolve the ſalt; that being done, pour on ſome river water, and boil them all together, in an alembick for the ſpace of four hours, without a neck, and the amber will be of a delicate white ſhining colour, when poliſhed.

To caſt Horn in Moulds like Lead.

Take aſhes of wine lees, burned and unſlacked lime, and make a ſtrong lee, put into it the ſcrapings or thin ſhavings of horn, and let them boil till the horn becomes as pap or jelly, then mix with it ſuch colours as you would have the horn be of and caſt it into what mould or figure you would have it repreſent; when it is cold it will harden like glue, and be of an entire piece, and retain the colour very well. And thus you may caſt the figures of flowers, beaſts, birds, or any other thing in horn.

To make a Stone that ſhall take Fire and burn of itſelf, if wet with your Finger.

Take a lead-ſtone that will draw iron well to it on the one ſide, and put it away on the other ſide; put it in a leaded pot; put to it four pounds of pitch, and one pound of brimſtone; lute and well clay your pot, and ſet it in a furnace, giving it a gentle fire the ſpace of one day and a night, augmenting the fire the ſecond day, and the third day more, whilſt the ſtone is on fire, and when it is well burnt, cool it again and cleanſe it; ſo when at any time you wet it, that part will appear on fire, to the admiration of the beholders.

CHAP.

CHAP. XI.

Inſtructions how to caſt Figures in Wax, Plaiſter, Paſte, Metal, &c. Leaves. Flowers, Medals, and other rare Curioſities worthy of Note.

How to caſt the Figures of various Sorts of Animals.

WHEN you have the figure ready to mould, then oil it, and take off the hollow mould in plaiſter, after this manner, viz.

Having well oiled it, lay it on potters earth, and make choice of thoſe parts of it you think are moſt convenient to take off, and there make an edging or border of the like earth; this done, caſt your plaiſter, well tempered, not too thick nor too thin; that part being well baked, gently lift it up in as few pieces as you can; repair the edges, and make little notches with a knife, the edge being oiled, and ſo put them exactly together again; after this manner a border or edging of the ſame earth, in the place whence you took the part of your figure, which done, caſt your plaiſter as before, and ſo lift up your piece to repair it; then putting it into its place, continue thus till all be done, which well dried, dreſs the outſide of the mould with a flat ſmooth piece of iron; and when well hardened, mark the pieces one after another, then let them leiſurely dry, and join and tie them together with a ſmall cord, and ſo you have a compleat hollow mould of plaiſter, which as the pieces are more or leſs difficult, may accordingly be made of more or leſs pieces, from three to twelve, &c.

How to caſt a hollow Figure, &c.

Supple the inſide of your mould of Paſte, till no more oil will be taken in; then with cotton wool dry it, and tie all the pieces together with ſmall cord; then ſeek a convenient mouth or caſting place, and ſo melt your wax, made tough with a little fine turpentine, and when it is neither too hot nor too cold, run it into the mould; if your figure be but little, fill it, and after a ſmall time take out the ſtopple of the mouth, and ſuddenly turn the figure upſide down, that the remaining wax may run out: and when you perceive it is ſufficiently cold, open it, and you will have a hollow wax figure. If you find it too thin, let the next remain longer in the mould; if too thick, pour out what remains ſooner, and theſe figures, when repaired and poliſhed, you may paint to any lively colour.

How to put an inward Mould or Kernel into any Waxen Figure.

If your figure be of a living creature, with a moderately hot knife divide it into two parts, lengthways or croſſways; then take potter's earth mixed with a little fine charcoal duſt, moiſtening and beating them with a little iron rod, till all is well incorporated, and as ſoft as paſte, and with this paſte fill the inſide of the waxen figure; which dry, cover the outſide of each piece, where they are to be joined with the like earth, very thin and moiſt, but beware it run not over the edges of the wax, and having joined it, repair it with a thin piece of copper or iron warm upon the joint; then make a git or caſting hole in the moſt convenient place, and let it be long enough with breath holes. If you conceive any part of the figure to which the metal will not eaſily paſs, then roll up little pieces of wax about the thickneſs of a gooſe quill, or according to the ſize of the figure, which with a heated inſtrument ſtick to ſome part of it, that the end may reach the place ſuſpected, where the metal will not eaſily run, and there faſten it; then take little tags, or iron about that bigneſs, about half a finger long, proportionable to the thickneſs of the wax of the innermoſt mould, and thruſt theſe quite thro' the figure, to the purpoſe that the kernel, being in all parts ſupported, it may not touch or join to any part of the outward mould.

To make the Caſes or Facing, &c.

Take founders earth, very fine, and ſteep it in a veſſel of earth, filled with fair water, and by inclination pour it into another, that the droſſy part may remain behind; then add to it ſome bone, mix them well together, and with a large pencil give a ſmooth laying of the earth on the waxed figure; dry it, and do ſo ſix times, and when it has had the laſt drying, ſtrengthen it with potters clay, well mixed and beaten with hair, and that being dry, put your mould over the fire, on iron rods, in form of a gridiron; but beware the wax boil not within the mould, leſt it break it; lean it then on one ſide, that the wax may all run clear out at the caſting mouth; then heat your figure over a gentle fire, till it be well hardened, and melt the metal you intend to caſt the figure into, in a good heat, and have two crucibles in the fire, one empty to pour the metal into, that the droſs and ſcum may not remain in it, and when it is at a proper heat, ſet the mould faſt in ſand, pour in the metal, and let it thoroughly cool; ſo by breaking your mould, you will have a perfect figure without ſeam; but if the figure be large, you muſt bind the mould with nealed wire, leſt the weight ſtrain and flaw it.

To caſt Medals very lively.

To do this, calcine ſpeculum, or ſpaud in a crucible, then put it into a veſſel of earth, and pour water on it; and when you have well ſtirred it, add as much more water, and being ſettled take it out, and make it into balls; then a ſecond time calcine it, and beat it into powder, ſprinkle ſome vinegar on it, and by that means make it into a paſte; then a third time calcine it, and when cold beat it to powder, and ſearſe it very fine, adding an ounce of ſal armoniack diſſolved in water, to twelve ounces of ſpeculum; keep it then in a cellar, and with it make your moulds, or otherways frame your medals of it, moiſtening it; alſo with crocus martis, or ſaffron of iron, may be made another ſpaud, in which you may caſt the fineſt hair imaginable.

To caſt Lawrel Branches, Flowers, Vine Leaves, and the like curious Things.

To do this, make a circle of earth like a box, to the bigneſs of the thing you intend to caſt; and imitate ſuch branches, leaves, and flowers, as are of a good ſubſtance; for if too thin, the metal will not without great difficulty run; and when you have choſe what you deſign, run a needle with a thread at the end of the ſtalk of the flower or leaf, and ſo thro' the middle of it, faſtening the one end of the thread to the bottom of the circle, and the other to a ſtick that is to ſupport over againſt it in a perpendicular line, that your flower or leaf touch not the ſides of the circle; but before you faſten either, put a little piece of wax at the end of the ſtalk for a git hole, which muſt touch the bottom where the thread was faſtened. Having done this, caſt a compoſition of plaiſter of brick and plume, with ſal armoniack water; and when it is well mixed, very fine and dry, bake it till the flower be wholly conſumed that it encompaſſes, and has taken the impreſſion off; and being almoſt cold, run into it tin, ſilver, or other metal; if tin, you may put a third part lead; or if ſilver, a little copper; and you will find the leaves or flowers very curiouſly taken in the metal, take them out by little and little, breaking off the mould; and after this manner you may caſt all reptiles or creeping things.

To mould off Figures in paſte.

Take the crumb of a new-drawn white loaf, mould it till it becomes as cloſe as wax, and very pliable; then beat it and rub it with a rolling pin; as fine and far as it will go; then print it on the moulds, and when it has taken the ſuitable figure you deſire, dry it in a ſtove, and it will be very hard; and to preſerve this from vermin, you may mix a little powder of aloes with it.

To mould ſmall Figures of Jaſper colour.

Oil your moulds with a fine pencil, and diverſify them with ſuch colours as you pleaſe, with gum tragacanth, if they ſpread or run, put a little of the gall of an ox, for the thicker the harder it will prove; then mould your paſte of the colour of jaſper, or the like; put it in to fill the mould, tye it with a wire, and take it out, repair and varniſh it, and ſet it to harden.

Red Marble or Porphiry to counterfeit.

Take Engliſh brown, if it ſeem too reddiſh put ſome umber or ſoot; then take a very ſmooth board, a well poliſhed marble, or a large piece of glaſs a little oiled: Then take ſome Engliſh brown, with ſome roſet or lake, and grind them with gum tragacanth, then with a large bruſh flurt or ſprinkle the glaſs, according to the marks and veins of the ſtone. When it is enough ſpotted, let it dry; then temper your Engliſh brown and umber with gum tragacanth water into a paſte; which being laid on the ſpotted glaſs or marble, let it dry, and poliſh it.

CON-

CONCERNING

THE

LOADSTONE.

Of the Loadſtone.

THE loadſtone is a very hard and very heavy ſtone, the colour of which approaches commonly to that of iron, which it attracts by a peculiar virtue at a reaſonable diſtance, and that with a force that makes a ſenſible reſiſtance when you go to part them. This admirable ſtone has many fine properties, which I am now briefly to hint at.

The loadſtone has not only the virtue of attracting iron even by penetrating the intervening bodies; but likewiſe that of communicating to the iron, which in like manner acquires the power of attracting another: For we ſee with our eyes, that an iron ring touched by a good loadſtone, lifts another ring, and that ſecond ring lifts a third, and ſo on. We ſee likewiſe, that a blade of a knife touched by a loadſtone, raiſes needles, and iron or ſteel nails.

If you lay ſeveral ſewing needles cloſe to one another upon a table, and bring a loadſtone near the firſt; 'twill attract the firſt, which acquiring a magnetic virtue, will draw the ſecond, and that the next, and ſo on, till all the needles hang to one another, as if they were linked together unleſs you part them by violence.

Iron reciprocally attracts the loadſtone at a reaſonable diſtance, when that ſtone can move freely, as when it is hung up, or floats in water; notwithſtanding the intervention of another body. For example, put a piece of loadſtone in a light boat made like a Gondola, ſo as to make the loadſtone float upon the water, and preſent to it a piece of iron at a reaſonable diſtance, you'll ſee the Gondola cut the water to go and join the iron.

This puts me in mind of a clock I once ſaw at Lyons in Mr. Servieres's cloſet, which ſhewed the hours by throwing an artificial frog into a baſon of water, round which the hours were marked, as upon a dial; for the frog ſwimming upon the water, ſtopped and pointed to the reſpective hour, and inſenſibly followed the hour of the day, like the hand of a clock. I judge this was done by a Loadſtone hid under the baſon, which followed the hour of the day by the virtue of clock wheels, and drew to the ſame hour the frog, in which no queſtion, was hid a piece of iron.

When a loadſtone floats upon the water, without any thing about it to cramp its free motion, or hinder it to take what ſituation it finds moſt convenient, it turns always the ſame way with reſpect to ſouth and north; ſo that one particular part of the ſtone always looks to the north, and its oppoſite to the ſouth; whence theſe two places pointing to the two poles of the world, are called the Poles of the loadſtone; and the ſtraight line paſſing from one pole to the other, is called the Axis of the loadſtone. Now, all the force and efficacy of the loadſtone is in this axis, for the other parts off, the axis have very little virtue; and it is chiefly from the two extremities or poles, as from two centers, that the virtue is diſtributed.

That part which is equally remote from its two poles, we call the Equator of the loadſtone; and this has ſuch a quality, that if you lay a ſewing needle upon it, 'twill lie all along it, parallel to its axis; but if you take it off of that line, it riſes more and more as it approaches to one of the two poles, where it ſtands upright. This is diſtinctly obſerved in the ſpherical loadſtones, which I here ſuppoſe homogeneal, as they commonly are, for otherwiſe they may have more than two poles. I know a gentleman at Lions, who has a loadſtone that has four poles, two on the ſouth ſide, lying oppoſite one to another, and two after the ſame manner pointing to the north.

The loadſtone communicates its virtue not only to the iron that it touches, but even to that which paſſes near it; it attracts likewiſe another loadſtone, and ſometimes repulſes it, according to the different aſpects of their poles, which are called Friendly Poles when they are of a different denomination, that is, the one meridional, the other ſeptentrional; and Hoſtile poles, when they are of the ſame denomination, that is, both meridional, or both ſeptentrional: For the north pole of one loadſtone, attracts the ſouth, and repels the north pole of another, and è contra; provided the other can move freely, as when it floats upon water, when the poles are friendly, it draws it indeed to a certain diſtance, but repels it if it comes nearer.

We obſerve in all loadſtones, that when the north pole of one has attracted the ſouth pole of another, the aſpect of the north pole of a third parts them. Here I purpoſely wave the reaſons of theſe phænomena, becauſe they are abſtruſe, and improper for recreation.

When we ſay, a loadſtone in attracting iron penetrates all ſorts of intervening bodies, as freely as if there were none between; we muſt except the intervention of iron itſelf; for we find by experience, that the intervention of a plate of iron impairs the activity of the magnetick force; doubtleſs becauſe the virtue taking hold of the plate, is partly ſpent upon it.

When we ſay, that the loadſtone draws iron to it, we muſt ſuppoſe that it can draw it; for if it cannot, and if it is at liberty to move, the iron reciprocally attracts it, and when joined together they ſenſibly reſiſt the efforts of ſeparation.

Tho' the magnetick virtue penetrates all intervening bodies, iron excepted, with as much facility as if nothing intervened, yet it is obſervable that this virtue is communicated with more difficulty thro' fleſh, than thro' any metal whatſoever.

When we ſay, that the blade of a knife acquires the magnetick virtue by being touched with a loadſtone, we muſt add, that this virtue is communicated to the part of the knife that is laſt touched; ſo that if you rub the blade of a knife from the haft to the point along a loadſtone, all the magnetick virtue will remain in the point, and the other end towards the haft will have no attractive force; and if you rub it the contrary way, the virtue will be tranſplanted to the other end. Farther, the virtue thus imparted will be greater or leſs, according to the place of the loadſtone that the blade is rubbed upon; ſo that if you rub it upon one of the poles where the vertue is moſt efficacious, it will receive the greateſt attractive force that it is capable of.

All loadſtones are not equally good; and we muſt not always judge of the goodneſs of them by their weight; for ſometimes an ounce of loadſtone is able to lift a pound of iron; tho' indeed of two loadſtones of equal vigour, the greater has always more force than the leſs. The more ſolid, and leſs porous that the ſtone is, the greater is the force; and it has more vigour when poliſhed than when rough, and more ſtill when armed with a plate of ſteel or poliſhed iron. But here you muſt obſerve, that if a loadſtone thus armed, holds iron by one of its poles, and the friendly pole of another naked or unarmed loadſtone is preſented to it, it holds it the more forcibly; but upon the preſenting of the hoſtile pole it loſes the force and lets it drop. In breaking a loadſtone, you may find one part of it to have more force than the whole ſtone.

The loadſtone attracts twice as much ſteel as iron, and at a greater diſtance; for the former being ſolider and leſs porous than the latter, it joins more intimately with the former; and when thus joined with fine well poliſhed ſteel, it attracts a greater weight, than when faſtened to groſs unpoliſhed iron. A ſtronger loadſtone draws a great weight with more expedition, and at a greater diſtance, than a weaker ſtone. We ſeldom ſee a large loadſtone raiſe more than its own weight, unleſs it be armed; but oftentimes we meet with little ones, that raiſe ten, twelve, and ſometimes eighteen times their own weight; thus an ounce ſtone, will raiſe a pound of iron, as above.

We ſometimes obſerve with aſtoniſhment, that a large fine loadſtone ſtrips a little one that comes too near it of its virtue; but the little one recovers it again in two or three days. We obſerve likewiſe in breaking off a part of a ſtone, the axis and the two poles ſhift their places. Father Schott the jeſuit tells you, that if you cut a loadſtone by its equator into two parts, each part will have two poles, a new pole at the ſection, and the old one at the old place, bearing the ſame name; and if you cut it in two by its axis, each part acquires new poles, of a ſimilar ſituation to that of the poles of the firſt ſtone, and likewiſe with the ſame properties.

This ſtone is ſo hard, that ſcarce any iron inſtrument will touch it, and it cannot be cut but with a braſs ſaw without teeth, made as ſharp as a knife, and with the powder of emmery dilated in water; it being impoſſible to cut it with any other ſaw tho' of the fineſt ſteel.

I forgot to acquaint you, that by the north pole of a loadſtone, we underſtand that pole which turns or points to the north, when the ſtone hangs free by its equator; and by the ſouth pole, the oppoſite pole that points to the ſouth. I ſaid, when it hangs free by its equator, for if it was ſuſpended by one of its two poles, it would continue unmovable, becauſe the north pole could not then turn to the north, nor the ſouth pole to the ſouth.

Some will have the loadſtone to be called in latin Magnes, from Magneſia, a country in Macedonia, where it is frequently found. Now, the Magneſia loadſtone is ſometimes black, ſometimes red; the Natolia loadſtone is white; but, as hiſtorians tell us, neither of theſe has much virtue. The Ethiopian loadſtone, which is very heavy, and very vigorous, is ſometimes yellow. The beſt loadſtones we have in Europe, are for the moſt part found in Norway. There is a ſort of red, and of blue loadſtone, which Diſcorides prefers to that of the ruſty colour. In Italy they have a ſort of loadſtone, that is red on the outſide, and blue within, which when beaten gives a ſort of flour, that iron attracts at a certain diſtance.

If the name of loadſtone be allowed to the ſtones that attract other metals, we may reckon in this liſt, a ſtone called Pantarbe, which attracts gold, and another called Andromantie, which attracts ſilver. Cardan ſays, there is a ſtone called Calamites, that attracts fleſh. In Ethiopia there is a ſtone called Theamedes, that inſtead of loving iron cannot endure it, and repels it; which has given ſome occaſion to ſay, that as thoſe who carry iron about them to the loadſtone mountains cannot ſtir, ſo on the other hand, if theſe mountains produced the Theamedes, they could not keep to a fixed ſtation.

To conclude this problem, the beſt loadſtones are commonly thoſe of a watery, or of a ſhining black colour, and very little red; and of a ſolid homogeneous ſubſtance, that is, they have but few pores, and are free from the mixture of a foreign matter. The figure of a loadſtone contributes very much to its force, for it is a ſtand-meet with little ones, that raiſe ten, twelve, and ſometimes eighteen times their own weight; thus an ounce ſtone, will raiſe a pound of iron, as above.

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The loadſtone preſerves its virtue in filings of ſteel, tho' the filings may ruſt with it, and likewiſe impair its virtue; but the violence of fire impairs it more in one hour, than the ruſt does in ſeveral days. Father Dechales ſays, the loadſtone does not attract red hot iron, the occaſion of which is undoubtedly this, that the heat diſſipates the magnetick ſpirits, by putting them in motion.

In fine; a loadſtone alſo loſes its virtue of attracting iron, when it is beat too violently upon the anvil; for that changes the diſpoſition of its parts, and the figure of its pores. This reaſon is confirmed by the experience of Mr Puget, who having put filings of ſteel into a glaſs tube, and placed a good loadſtone near the filings in order to communicate its virtue, obſerved that theſe filings loſt their magnetick virtue, by being ſtirred and moved, ſo that they could not attract needles, as they had done before. To this purpoſe, it is ſaid, that if a magneted ſteel needle changes its figure, that is, is turned from a ſtraight to a bended, or from a bended to a ſtreight figure, it loſes its virtue quite.

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